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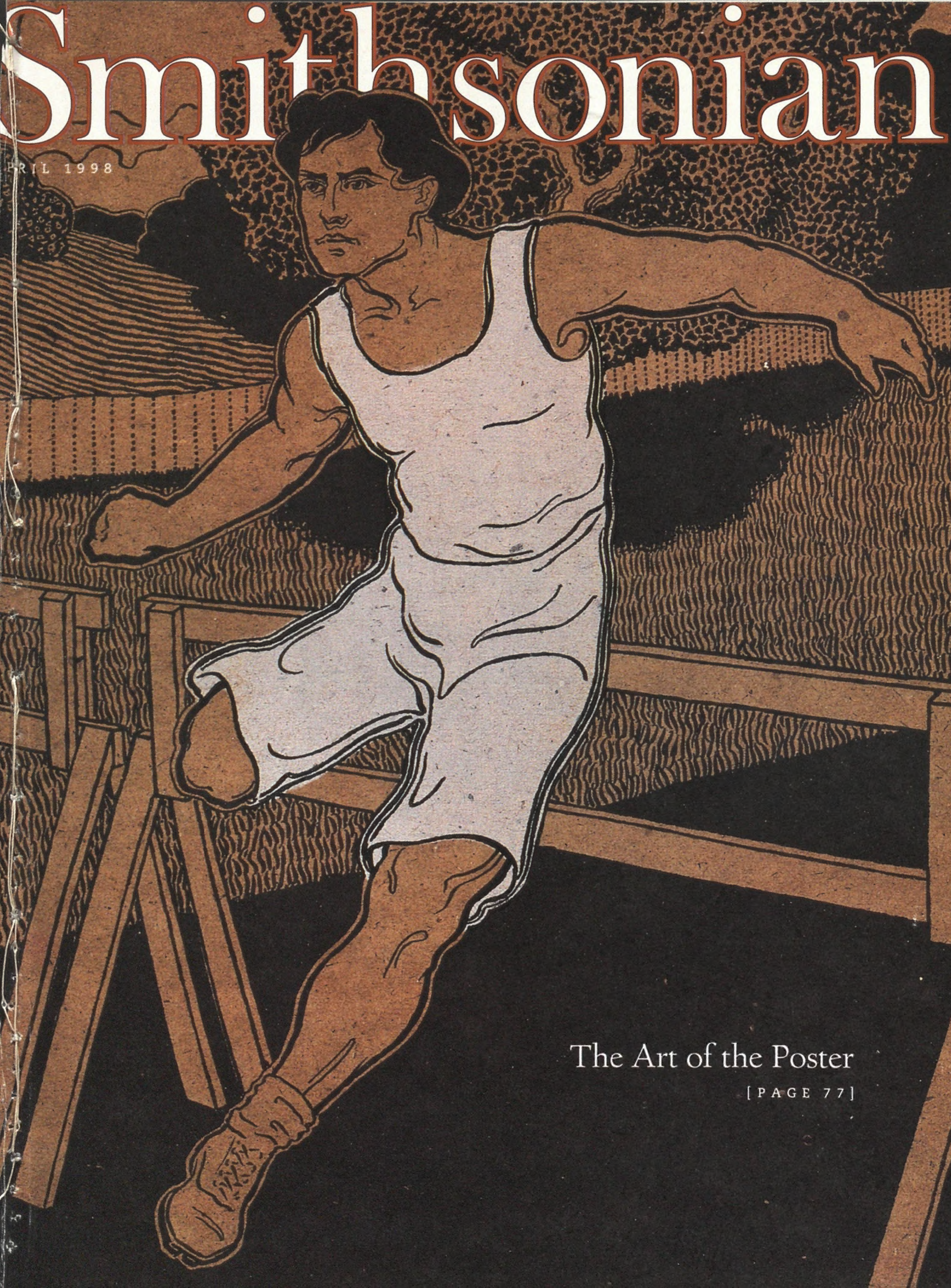

The Art of the Poster

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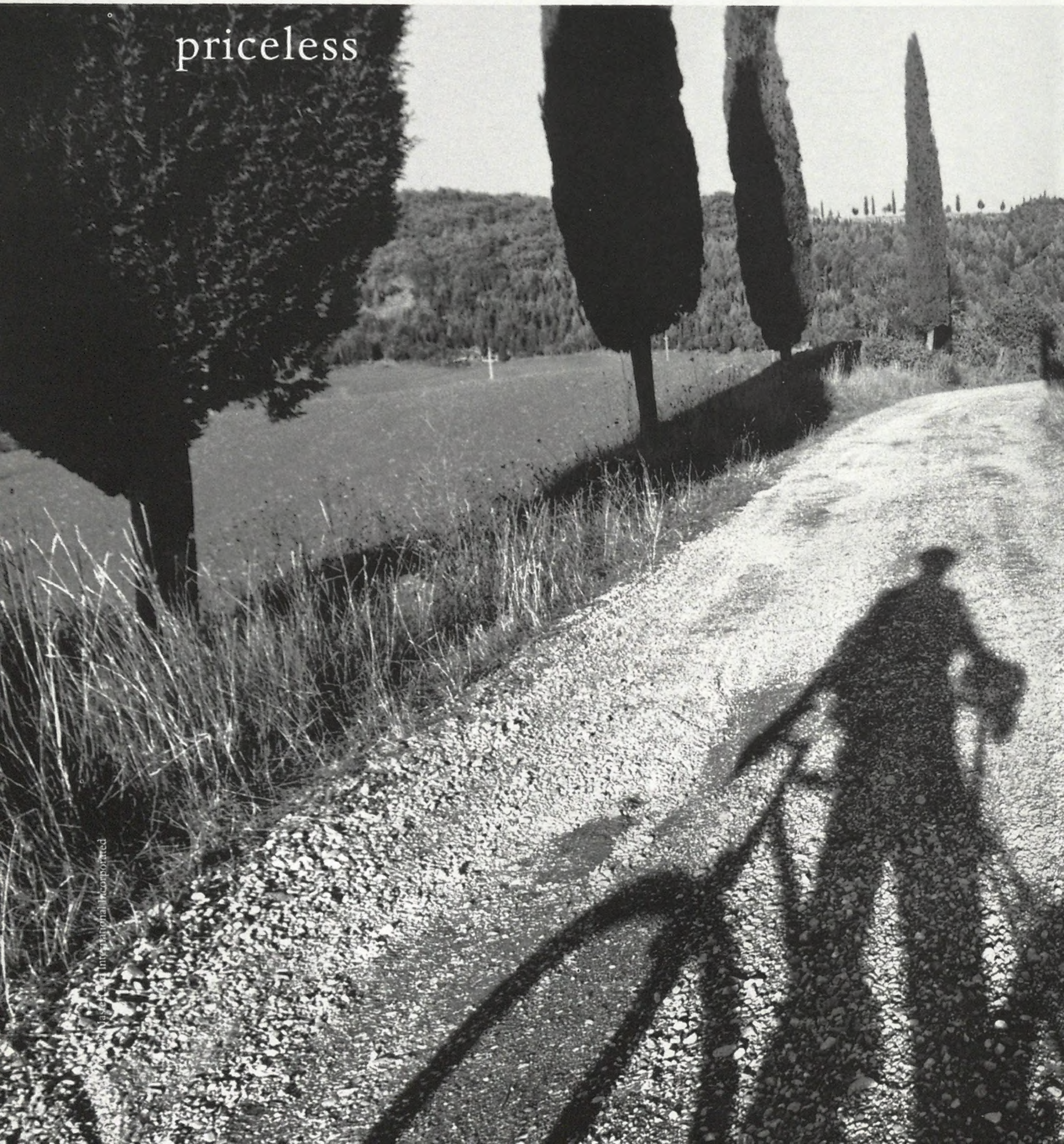

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Cover A hurdler eyes the finish in John Sloan's 1896 poster (detail) for *Cinder-Path Tales*. In Japanese prints, said Sloan (later a member of the Ashcan School of painters), "I found fresh ideas about design, discovered in observing everyday life."
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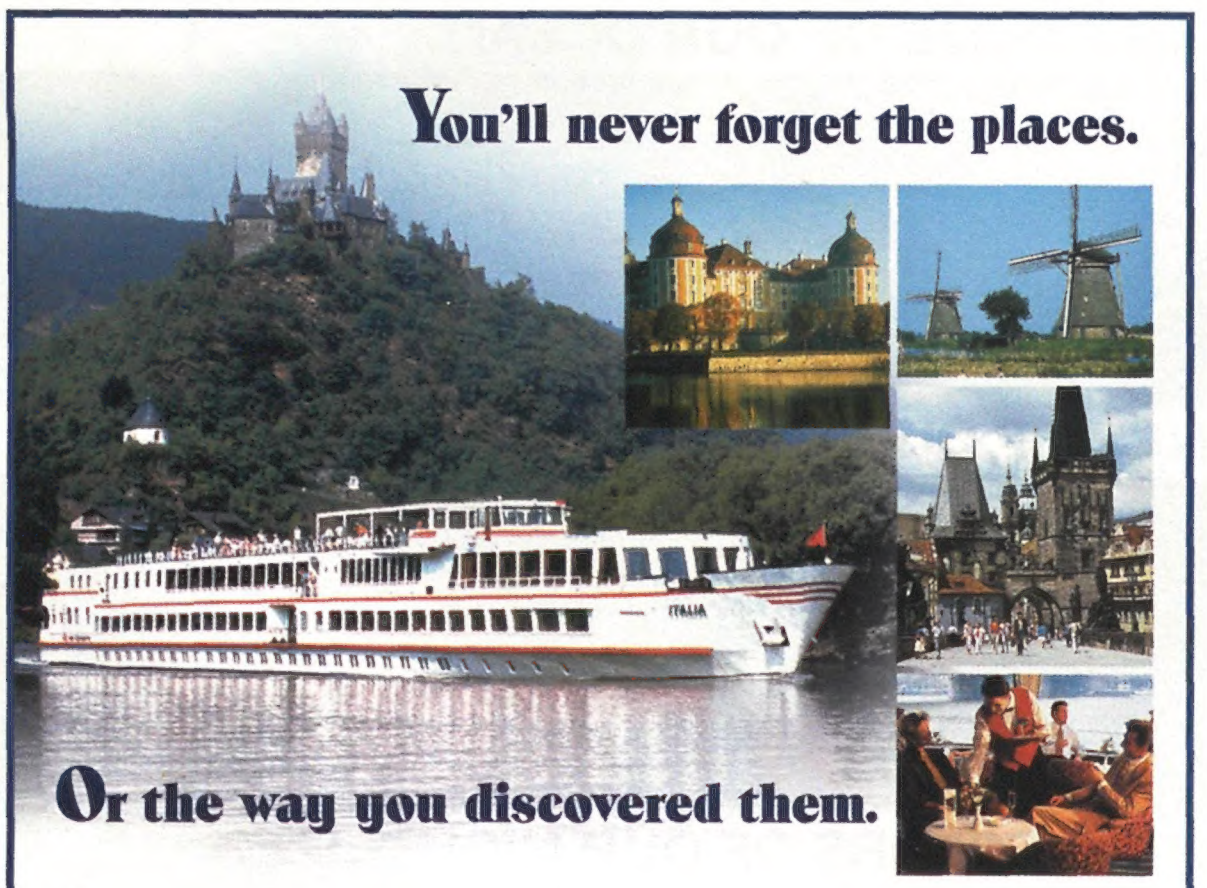
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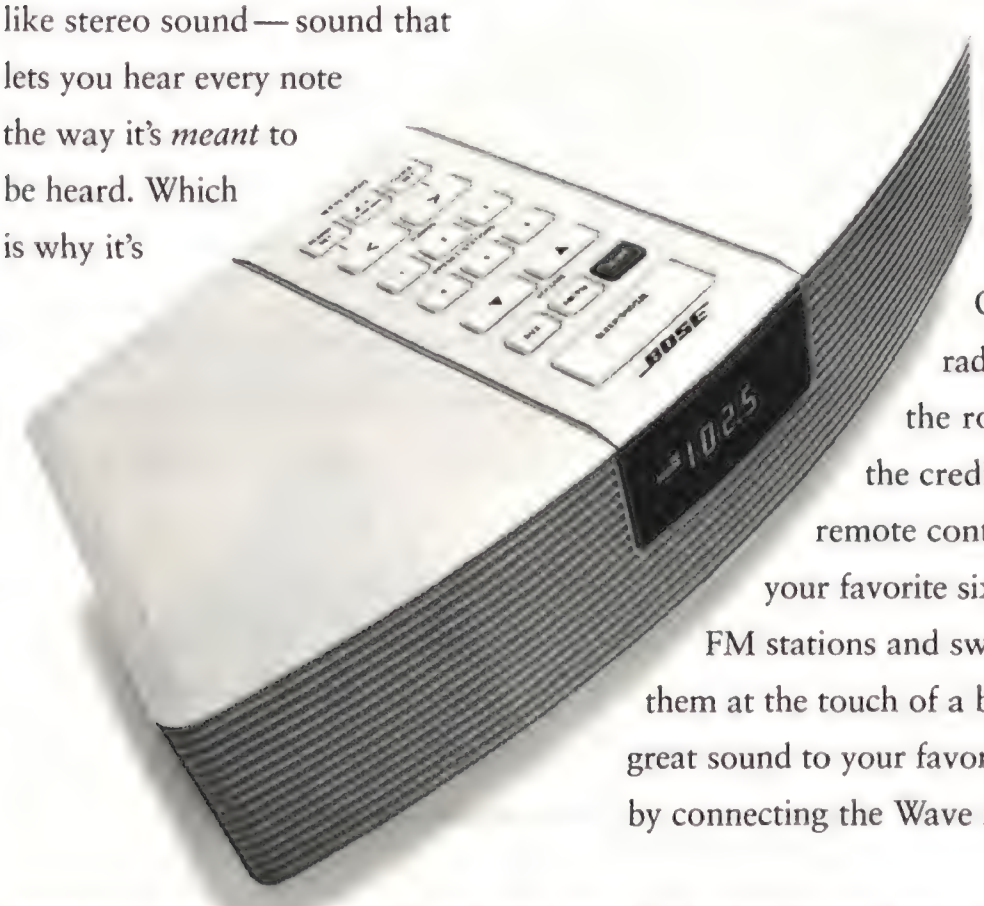

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SMITHSONIAN PERSPECTIVES

Lessons from the Mall

FROM COURSES TO CRUISES, THE SMITHSONIAN HAS EDUCATIONAL AND CULTURAL ADVENTURES FOR EVERYONE

I HAD THE PLEASURE RECENTLY OF AWARDING THE James Smithson Bicentennial Medal to filmmaker George Lucas before an enthusiastic audience of 1,400 Smithsonian members and guests. The opportunity arose in connection with the opening of the popular new "Star Wars" exhibition at the National Air and Space Museum. The Smithsonian Associates (TSA), the education and outreach program for the Institution's members, had invited Mr. Lucas and two of his colleagues to take part in a seminar on the art and craft of contemporary filmmaking.

Participating in this event reminded me, once again, of the vital role The Smithsonian Associates plays in the life of the Institution. With its multitude of educational and travel opportunities, the organization is critical to our mandate to spread knowledge to the broadest possible public. TSA's range of unique educational programs—in-depth seminars and courses; interviews with policymakers, artists and innovators; performances and film presentations; African American Studies Center programs; children's workshops; hands-on studio-arts classes and study tours to all parts of the world—brings the knowledge and talents of today's intellectual and cultural leaders to hundreds of thousands of people. The program with George Lucas—one of more than 1,500 that The Smithsonian Associates offers each year to residents of the greater Washington region—is a fine example of TSA's ability to attract experts in contemporary culture and scholarship.

In addition to day trips for area residents, The Smithsonian Associates extends the reach of the Institution across the country through its study tours. Some 350 trips a year offer unlimited opportunities to explore the world in the company of fellow Associates and outstanding scholars. As part of its outreach efforts, TSA also takes Smithsonian resources into communities like yours. One such program is Voices of Discovery, which brings Smithsonian experts into classrooms, museums, libraries and other public places. In 1997 alone, The Smithsonian Associates presented 400 free programs to more than 25,000 people in five metropolitan areas visited by the "America's Smithsonian" traveling exhibition.

Considering that The Smithsonian Associates receives no federal funding—it is supported largely through income generated by participation fees—the reach of its activities is truly impressive. On the day that we honored George Lucas, members of The Smithsonian Associates, as well as others in the Washington area, had an opportunity to participate in a wide variety of programs. Civil War buffs enjoyed a lecture on Ulysses S. Grant; others attended courses ranging from "Coral Reefs" to "The Ming Dynasty," and aspiring artists selected from five studio-arts courses, including calligraphy and photography. Graduate students from the Parsons School of Design attended an American heritage seminar cosponsored by TSA and our Cooper-Hewitt, National Design Museum.

Beyond the National Mall on that same day last October, Smithsonian Associates were on the road with TSA's study tours. Some had just arrived in Bluff, Utah, for a photography seminar. Others were learning about the folk art and music of Mexico in the Jalisco region—famous as the birthplace of mariachi music. In Kathmandu, Nepal, our members strolled through colorful bazaars. Other study tour travelers explored Greece, Italy and Costa Rica; some were aboard the *Marco Polo* en route to the Suez Canal. Meanwhile, TSA staff were putting final touches on weekend tours to Chinatown in Washington, D.C., and to Frank Lloyd Wright's Fallingwater in Pennsylvania.

Closer to my office that day, schoolchildren attended performances in TSA's Discovery Theater, which presents such original productions as *Platero*, written by Nobel Prize-winning poet Juan Ramón Jiménez. With more than 20 productions each year, Discovery Theater provides 70,000 children and teenagers with an opportunity to see and participate in live theater.

All this on a single weekday! TSA reaches more people than it can count, especially as it makes use of various technologies. Some of its programs are now available on audiocassettes; it just completed its first video for cable distribution, and Discovery Theater's scripts and study guides are available on the Web. To learn more about all of The Smithsonian Associates' activities, visit the TSA Website at www.si.edu/tsa.

The Smithsonian Associates comprises an extraordinary intellectual campus—one that is far-reaching and diverse, and of which the Institution can be justly proud.

I. Michael Heyman

I. MICHAEL HEYMAN, SECRETARY

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LETTERS TO THE EDITOR

WILDLIFE REHABILITATORS

MY THANKS TO WRITER BIL GILBERT and photographer Bill Ballenberg for giving us a glimpse of the work of wildlife rehabilitators in the February issue. I am a permitted rehabilitator—a biophiliac—in Massachusetts, and the article will help me explain to families who bring me orphaned animals what it is that I do.

Our work may have little significance in the grand scheme of things, but rehabbers often tell an adapted version of an anecdote in Loren Eiseley's essay "The Star Thrower." A man walking along the beach after a storm sees a younger man ahead of him moving along the tide line, picking up stranded starfish and tossing them back to sea. The older man asks why the star thrower is doing this: "There are so many; what you are doing cannot possibly make a difference."

The younger man picks up another starfish and replies as he tosses it back to sea: "It makes a difference to this one."

Mary Stafford
Allston, Massachusetts

WILDLIFE REHABBERS MAINTAIN THAT it's the individual that counts. Biologists plump for species. A biologist may assert that rehabbers have little impact on an animal population, that rehabilitative efforts are counterproductive because they put defective animals back into the gene pool, and that this compromises "survival of the fittest." They may also argue that the time and expense that rehabilitators put into an animal would be better expended on a whole species, without which there would be no individuals. I have been a veterinarian for half a century and a biology instructor at a university for 30 years, and I think I can see both sides. There is room for both rehabbers and biologists; there are many ways we can serve wildlife.

Kenneth B. Haas, D.V.M.
Kalamazoo, Michigan

CERTAINLY THE REHABILITATORS FEATURED in your article deserve to spend their leisure time as they wish. But there is a limit, such as Sally who saved the baby house mice from death by ferrying them to and from her office each day so she could hand-feed them. Also, I found it disgusting that Judy gave suckle to a beaver from her own breast. This is about as shocking as having sex with an animal.

Herbert Fletman
Philadelphia, Pennsylvania

FOR TEN YEARS I HAVE BEEN A VOLunteer at the University of Minnesota's Gabbert Raptor Center, which is run by the College of Veterinary Medicine. I work in the clinic and treat injured birds of prey with medications, and I provide their evening feedings. Over the years I've played a role in several dramatic tales of injury, rehabilitation and recovery, and the release of owls, hawks, falcons, eagles, turkey vultures and trumpeter swans. I was given the opportunity to release a bald eagle back to life in the wild. It is hard to describe the emotion I felt at the time, but the rewarding event brought a sense of purpose to my work at the clinic.

The Website address of the Gabbert Raptor Center is www.raptor.cvm.umn.edu.

Joanne Plankers
Saint Paul, Minnesota

GENDRON JENSEN

HAD THE NOTED SWISS PSYCHIATRIST Hermann Rorschach (1884-1922) had artist Gendron Jensen at his side, we would have no need for his inkblots today. Jensen's exquisitely composed images of animal skeletal structures easily awaken visions buried in the deepest recesses of the subconscious.

Vytautas Matulionis
Cleveland Heights, Ohio

CORAL REEF

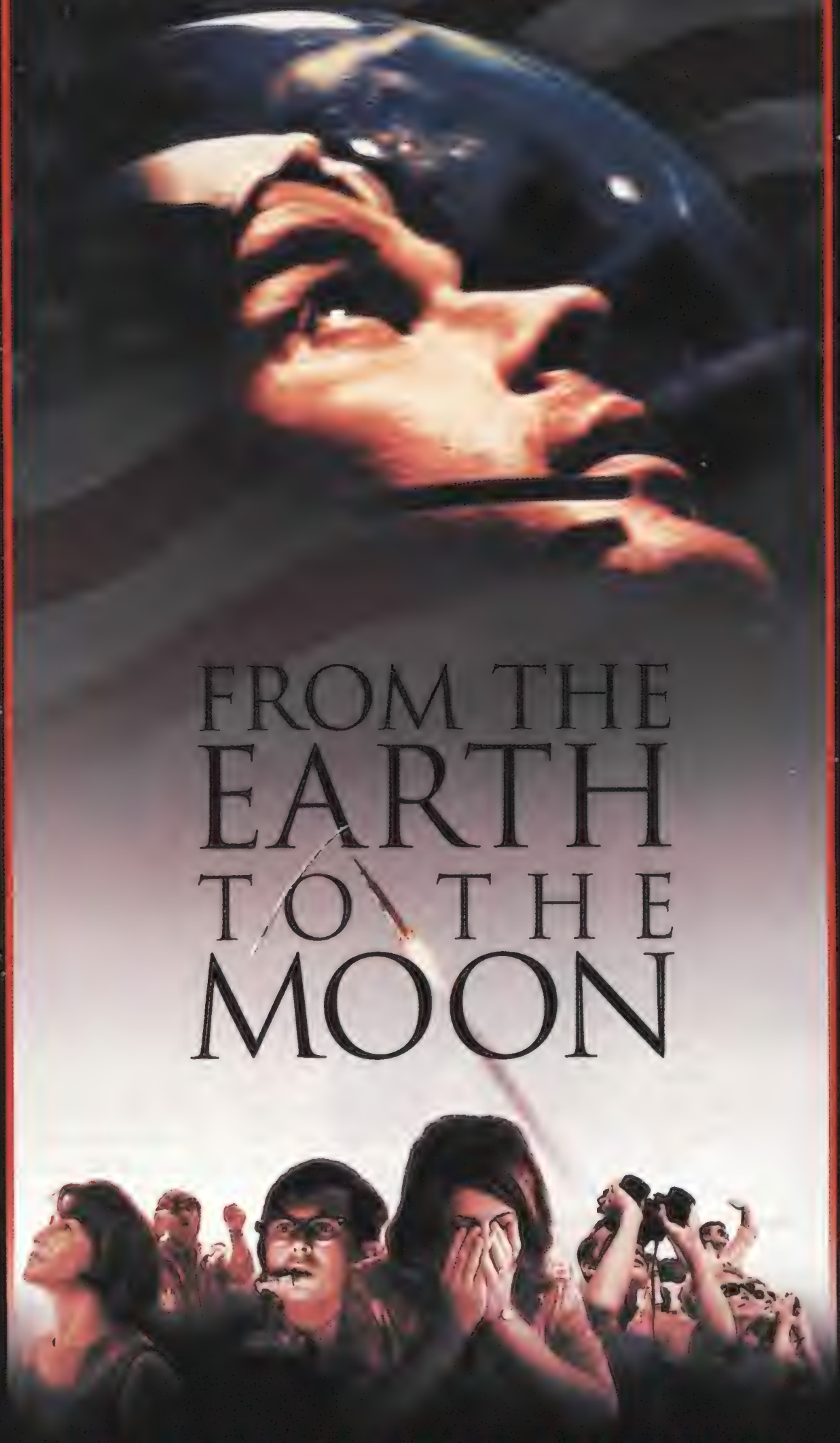
ABOUT 20 YEARS AGO, WHILE BAREboating in the British Virgin Islands, I had anchored for the night in a secluded and seldom-visited cove off Great Camanoe Island. An hour or so after sunset, while preparing steaks on the stern grill of my sailboat, I noticed an unusual phosphorescence developing in the water. A puddle of phosphorescence seemed to develop, then other growing tendrils rose from the depths to join it. The glow seemed to swirl, then fade from sight. As I looked over the bay, I saw this pattern repeated again and again. I called my companions on deck to view the phenomenon and to witness my veracity (and that I was not experiencing the effects from the last rum punch). All saw it; all concurred with my description. Since then I have described the experience to divers, marine biologists, sailors, Virgin Islands residents and others. None could explain it.

Imagine my surprise and delight when I encountered the article by John F. Ross about how some coral "broadcast spawn" once a year at night. His description of the polychaete worm "glowing like a disembodied length of neon sign, wriggling madly and exuding a diaphanous cloud of eggs" cleared up a long-standing mystery—and gave final confirmation of my veracity and sobriety 20 years hence.

John S. Bonner
Wimberley, Texas

BY PURE CHANCE, I WAS READING about the polychaete worm in Harry Pidgeon's book about a 1922 voyage, *Around the World Single-Handed*. The

TOM HANKS PRESENTS



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next day, I read about the same bioluminescent worm in your fine magazine. Pidgeon wrote that the natives of Samoa were well aware of the spawning phenomenon, and that they harvested the worms and ate them "raw and wriggling." The book did not say whether Pidgeon partook.

Alan Hurst
Snowmass Village, Colorado

JACK LONDON

IT WOULD HAVE ADDED A CERTAIN human dimension to Bruce Watson's panegyric about Jack London to mention that London was also a self-proclaimed racist (his writing on Jack Johnson, the first black heavyweight champion, is a fascinating study in grudging admiration) and that London was a devotee of Friedrich Wilhelm Nietzsche's theory of the Superman.

London was a remarkable man who lived a remarkable life, and he was a better writer than he is currently given credit for being. But he was also a bad guy.

In the last decade or so of his life, London bought story plots from other authors. At the time of his death, he was working on his last novel, *The Assassination Bureau, Ltd*, which was based on an idea by the young Sinclair Lewis. Robert L. Fish finished the book in the early 1960s, and it was later made into the 1969 British movie *The Assassination Bureau*, starring Oliver Reed and Diana Rigg.

Peter S. Beagle
Davis, California

JACK LONDON SHOULD BE AS FAMOUS for the best of his political writing as for his adventure novels. A reading of his powerful essay "Scabbing," for example, would be illuminating for anyone who wants to function more effectively in the workplace, nonunion as well as union. "Scabbing" is one of several essays in London's *War of the Classes*.

James R. Madison
Menlo Park, California

BEFORE EMBARKING ON THE MAIDEN voyage of the *Snark*, Jack London advertised for a cook. London chose a 23-year-old man with adventure in his soul for the job: Martin Johnson, the future wildlife explorer and photographer, and husband of Osa, who accompanied him on his expeditions [SMITHSONIAN, November 1986]. Martin Johnson recounted his experiences on the voyage in *Through the South Seas with Jack London*.

Ruth Winkler
Cuttingsville, Vermont

AROUND THE MALL & BEYOND

I PARTICULARLY ENJOYED MICHAEL Kernan's column about National Museum of American History curator Lonnie Bunch. His eye for detail is especially encouraging as he attempts to "let slaves speak for themselves" in the upcoming exhibition, "Communities in a Changing Nation: The Promise of 19th-Century America."

Vincent A. Munch
Ossining, New York

THE PICTURE OF THE FORMER SLAVE on page 24 is the most arresting photograph I have seen in years. It moves me because the immense natural dignity of the lady overwhelms any suggestion of her poverty or the effects of her hard life.

Francis Richardson
Greenville, New York

TIMES SQUARE

I READ DOUG STEWART'S ARTICLE about the rebirth of Times Square on an airplane to New York. I hadn't been to Manhattan for about three years, and I found the Times Square area noticeably cleaner, friendlier and safer. And it's brighter and gaudier than ever, in a joyful and playful way.

John Bridges
Chicago, Illinois

YOU QUOTED TAMA STARR, PRESIdent of the Artkraft Strauss Sign Corporation, as saying about the 1947 roof sign for the Bond Building: "And the splashing water [from the sign's waterfall] released positive ions, which are health-giving." This is untrue. Water produces negative ions, which creates a soothing effect. By the looks of all the lights, traffic and noise, the more negative ions, the better.

Sue LeMontre
San Diego, California

LAST PAGE

GERALD DUMAS WROTE THAT WHILE drinking beer at 2 A.M. and reading Mark Twain, he "came to a page that said, 'Last night I was still up at 2 A.M., drinking beer and reading Dumas.'" It is a funny coincidence for Gerald Dumas. The quotation comes from a letter Mark Twain wrote to his newborn daughter that begins, "Many's the time I've lain awake till 2 o'clock in the morning reading Dumas & drinking beer, listening for the slightest sound you might make, my daughter, & suffering as only a father can suffer, with anxiety for his child. Some day you will thank me for this."

Ken Chowder
Oakland, California

USS MAINE

I ENJOYED TOM MILLER'S ARTICLE about the USS *Maine*, especially his description of the salvaging and distribution of the ship's relics. One of the more unusual pieces recovered from the battleship was the bathtub of the ship's captain, Charles D. Sigsbee. It was originally destined for Urbana, Ohio, but local citizens deemed it "unsuitable." Nevertheless, they held it hostage until they received a brass shell from the ship.

On February 28, 1913, the tub was shipped to Findlay, Ohio, where it went on display in the City Hall for a while. The next year, the battered and rusty relic was being used as a coal scuttle in the patrol room there. Eventually, indignant citizens provided a glass case for the bathtub and placed it in the rotunda of the coun-

Walter is 71 years old and has a net worth of $1.68 million.

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IT'S NOT FOR HIM. After speaking with Merrill Lynch, Walter decided to give $2,000 each year to each of his children and grandchildren. They can use his gift to start or contribute to Roth IRAs, provided they have earned income. This allows Walter to help his loved ones get an early start on their retirement savings.

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This scenario assumes that a person contributes $2,000 every January 2 for 45 years instead of 35 years and achieves an 8% rate of return. ©1998 Merrill Lynch, Pierce, Fenner & Smith Incorporated. Member SIPC.

ty courthouse. In the 1970s, the historic tub found its final resting place at the local museum, where it is still proudly displayed.

Christopher W. Haley
Findlay, Ohio

A BOW ANCHOR OF THE *MAINE* IS IN Reading, Pennsylvania's City Park. It was dedicated as a memorial to the Spanish-American War Veterans on August 1, 1914, and the speaker was the Assistant Secretary of the Navy, Franklin D. Roosevelt.

David M. Hollenbach
Reading, Pennsylvania

THE SUBHEAD FOR YOUR ARTICLE described the USS *Maine* as a "storied dreadnought." This is an anachronism. Storied she was, but a dreadnought-class ship she was not. The USS *Maine* (BB2) was a second-class armored battleship that was launched in late 1889, and commissioned into the U.S. Navy in 1895. She blew apart the evening of February 15, 1898.

HMS *Dreadnought* was accepted into the Royal Navy on December 6, 1906—eight and a half years after the *Maine* sank—and changed the course of naval warfare for roughly 40 years. A major difference between pre-dreadnought-class ships such as the *Maine* and true dreadnoughts was that the latter had big guns of the same size mounted on turrets down the centerline of the ship. HMS *Dreadnought*, for example, had ten 12-inch guns on five turrets. Pre-dreadnought battleships usually had four 12-inch guns that were in fixed positions on the port and starboard sides. Smaller guns of mixed caliber supported these.The USS *Maine* had four 10-inch guns: two each on the port and starboard sides.

In the spring of 1904, the U.S. Navy presented a design to Congress for two new battleships that were similar to what would become HMS *Dreadnought*. Congress delayed authorizing the funding for a year, and the two ships were laid down in the fall of 1906. In 1909, the first U.S. dreadnoughts, the *South Carolina* and the *Michigan*, were launched. Had Congress acted more swiftly, the new class of battleship might have been generically called "South Carolinas."

For more information, see *American Naval Fighting Ships* (vol. IV) and Robert K. Massie's acclaimed book, *Dreadnought: Britain, Germany, and the Coming of the Great War*.

John Dell
Alexandria, Virginia

Mr. Dell is correct, but "dreadnought" is sometimes used to describe any powerful battleship. Ed.

THE OBJECT AT HAND

UNFORTUNATELY, EDWARDS PARK'S column about President Woodrow Wilson, his wife, Edith Bolling Wilson, and her Lalique brooch contains a factual error. Congress never "adopted the [Versailles] treaty." The U.S. Senate twice rejected the treaty, which incorporated the Covenant of the League of Nations: once with and once without "reservations." In 1921, the Senate approved and President Warren G. Harding signed separate peace treaties with our recent enemies. Wilson's vindication came with U.S. membership in the United Nations following the end of World War II.

Robert D. Geise
Selinsgrove, Pennsylvania

BOXES

AS AN ELEMENTARY SCHOOL TEACHER just prior to World War II, I painted two apple boxes green and used them as a stand to hold the water bucket and wash basin. A third held chips for starting the fire in the big old stove.

I still have two apple boxes that later served as toy boxes for my two daughters and now hold toys for my great-grandchildren. I used to file papers in an apple box. However, I now use a metal file to lose things alphabetically.

Jean F. Roath
Socorro, New Mexico

A TWO-BY-FOUR, AN OLD SKATE, A fruit box, a tin can for a headlight, and a few nails made a Cadillac of a scooter.

Stanley Crawford chooses to preserve his boxes; my childhood friends and I chose to utilize them.

Jerry Froehlich
Kill Devil Hills, North Carolina

MEERKATS

MANY THANKS FOR SENDING ME THE poster of the meerkats whose picture didn't make it into David W. Macdonald's April 1986 article. By eyeballing the small picture in the advertisement for the poster, I carved a figure out of tupelo wood of the meerkat standing second from the left. I thought you might like to see my little guy is no longer lonesome now that we have the poster.

Jim Saker
Harrisonburg, Virginia

WRITE TO SMITHSONIAN

Send letters for consideration in this column to SMITHSONIAN Letters Editor, P.O. Box 44400, Washington, DC 20026-4400, or transmit e-mail to LettersEd@simag.si.edu. Letters may be edited for clarity and length. Send all other queries and comments to SMITHSONIAN, 900 Jefferson Drive, MRC 406, Washington, DC 20560. Our Website address is: www.smithsonianmag.si.edu.

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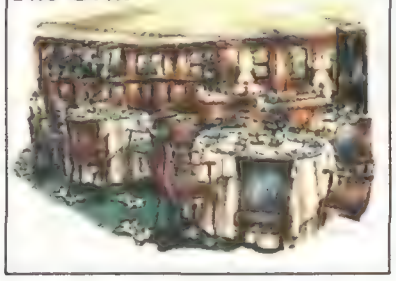
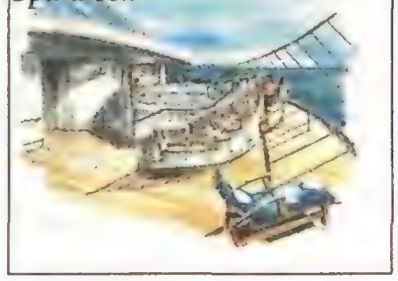
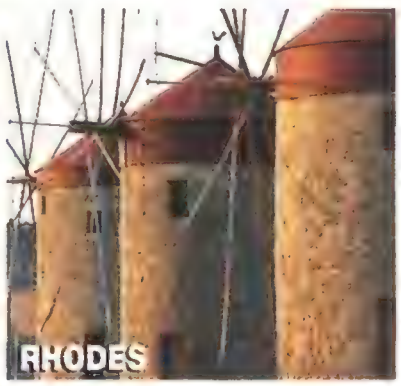
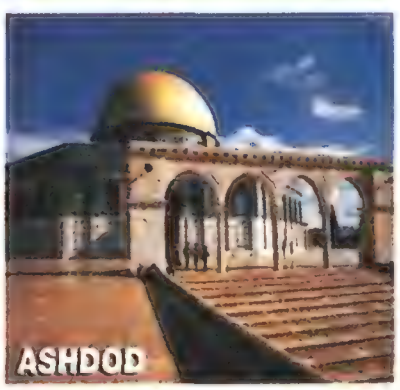


Casino Bar

Spa Deck







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PHENOMENA

COMMENT & NOTES

A Space Invader Is Here

AN INTERGALACTIC WAR IS GOING ON, BUT NOT THE KIND WE USED TO READ ABOUT IN SCIENCE FICTION MAGAZINES

BY JOHN P. WILEY, JR.

The red "amoeba" superimposed on a photograph of the Milky Way (our home galaxy) outlines a dwarf galaxy moving through our own. The interloper is on the far side of the galactic center and is not visible as a separate entity. The horizontal line marks the plane of our galaxy; the vertical stroke indicates the center.

IT'S A GALAXY-EAT-GALAXY UNIverse out there. Big ones eat little ones, then the big ones "merge" with other big ones. Mergers start out as collisions. Two spiral galaxies sail into and through each other, pulling long trails of stars behind them, then come back and do it again. Along the way, they compress each other's gases to trigger the formation of stars, hot stars brighter than a welder's torch. Finally each is caught by the other and they merge. The two galaxies may have been the breathtaking pinwheels of astronomy picture books before the merger, but afterward all we see is a blob of light known as an elliptical galaxy. The "Local Group," namely our own and some 25 other galaxies, someday will be one.

It could happen here. The Andromeda galaxy and we in the Milky Way galaxy are heading for each other at 300,000 miles per hour. And no one, no one, is doing anything to stop it. The excuse is that the collision, if there is one, won't happen for another three or four billion years. And unlike head-on automobile crashes, this one would take a few hundred million years.

In the meantime, it turns out that only in 1994 did we discover, by accident, that there is a smallish galaxy colliding with us right now. Known as Sagittarius for the constellation in whose direction it is found, the dwarf galaxy traces out an orbit that brings it to within 50,000 light-years of the center of our galaxy; the rest of our 12 satellite galaxies are all at a respectful 150,000 or so light-years. Sagittarius may not seem "close," but our galaxy is 130,000 or more light-years across (without its dark-matter halo). The Solar System is about 25,000 light-years from the center, so Sagittarius is only twice as far. You'd never know just from looking at them that its stars are part of another galaxy: Sagittarius is presently on the far side of the galactic center, and its outline is lost in the star clouds.

These galactic tidbits came to light at the annual meeting of the American Association for the Advancement of Science, convening in Philadelphia where it was founded 150 years earlier. Five thousand scientists and journalists came to hear 850 speakers on the hard, soft and social sciences.

Looking for a really big story, I naturally headed for "Galaxies in Collision." Bradley Whitmore of the Space Telescope Science Institute in Baltimore brought us up to speed. We've known for a generation or more that violent processes are the rule rather than the exception around the universe. Astronomers had not thought specifically about galaxies colliding, however, because they believed such events to be rare, although there had been clues to the contrary, Whitmore said. During the 1950s Fritz Zwicky at CalTech systematically photographed interacting galaxies, noting especially the wispy tails he guessed consisted of stars. In 1966 Halton Arp published his *Atlas of Peculiar Galaxies*, containing lots of images of what looked like colliding galaxies, and suggested that colliding galaxies could

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form stars in bursts. In 1983 a satellite that looks at the sky at infrared wavelengths found that the most star formation was occurring where galaxies were colliding. (Stars just beginning their lives are often obscured at optical wavelengths. They glow brightly in the infrared.)

Theoretical astronomers have been working on colliding galaxies since the 1940s. Not until the advent of supercomputers, however, could scientists follow the complex interactions between stars, gas clouds and dark matter. Nowadays they can produce "movies" of galaxies colliding. Chris Mihos of Case Western Reserve University is one practitioner. He uses several hundred thousand "superstars," each representing 100,000 stars, across thousands of light-years of space to produce his animations of collisions. (Mihos is quick to point out that the resolution in his simulations is only a tenth as good as that of actual images made by the Hubble Space Telescope.) He said it is no coincidence that our galaxy is "barred"—the center looks more like a wide, straight line than a circle—or that the disk is thick. We've been in collisions before.

In classical astronomy, the globular clusters (spherical bunches of, typically, 100,000 stars) that orbit our galaxy were thought of as being unique remnants of the beginnings of the galaxy. But the models and observation both find colliding galaxies causing bursts of star formation in brand-new globular clusters as well as in galaxies proper. At least some galaxies have three populations of globular clusters. In a galaxy known as NGC 7252, there are globular clusters made up of stars 15 billion years old, 500 million years old and only 10 million to 20 million years old. The last two presumably are the work of collisions. Some of the youngest stars are so hot that they will burn out in 10 million years. (The sun has been going strong for 4.5 billion years and is good for another 4.5 billion or so.)

Two merging galaxies have cast long trails of stars behind them, left. In the enlargement of the area outlined at right, the orange blobs with light as intense as lightning inside are the centers of the two galaxies. The dark streaks are dust. The sweeping patterns of bright blue and white are clusters of hot new stars formed in the collision.

Rosemary F. G. Wyse of Johns Hopkins University reported on our space invader, the dwarf galaxy known as Sagittarius. Three astronomers had been studying small squares of sky, measuring the motion of stars close to the Milky Way's galactic center, when they noticed that some stars were not moving like all the others. These mavericks were all moving together, and were part of a dwarf galaxy only one-fifth the size of our own, and with only one one-thousandth the mass. (Much of the mass has to be dark matter. The visible stars would not produce a gravitational field strong enough to hold Sagittarius together against the tremendous pull of our galaxy.)

If current estimates of its age are right, then Sagittarius may have passed through our galaxy ten times. It is also possible, however, that Sagittarius hit the Large Magellanic Cloud (a satellite galaxy visible to the naked eye in the Southern Hemisphere) not so long ago, astronomically speaking. It may have made only two passes through our galaxy since. Astronomers are now searching its orbit for streams of stars ripped out of Sagittarius by our own galaxy.

As to us colliding with the Andromeda galaxy, the watchword is relax. Mihos said we cannot yet tell whether it will be a true collision or a near miss. Watch this space for breaking news.

If we do collide, most people may never notice. Stars are so far apart that the Solar System might slide through such an event with no perturbation whatever. Mihos offered this analogy: if the sun were a marble on a step of Philadelphia's City Hall, then the nearest star would be in the Caribbean. The Solar System might be pulled out into a tidal tail, but while the night sky would look very different, our tight little family would be together as always.

Supercomputer animations of galaxies colliding have a magical look to them. (People with access to an Imax theater can see one in a film called *Cosmic Voyage*.) The trails of stars left curving through space after one galaxy passes through another look like a cross between pyrotechnic displays and the glittering trails left in the air by a fairy godmother's wand. Brilliant, brand-new stars blaze out where clouds of gas and dust have been mashed together. A critic might accuse the whole show of being "over the top." The rest of us tend to gape.

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SMITHSONIAN HIGHLIGHTS

TRAINED AS A PAINTER AND PRINTMAKER, artist Peter Houk was drawn to glass because of its direct and dynamic relationship with light. Nearly all his pieces incorporate natural imagery, as in his handblown, sandblasted platter with leaves and geckos (detail), above, left. Leather craftsman Mik Wright collaborates with his wife, artist Barbara Ann Volk, to create custom-crafted, colorful footwear under the logo Those Shoes. The handpainted and embossed boots above, right, boast whimsical motifs inspired by the client for whom they were designed. Each of jeweler Aaron Macsai's finely wrought pieces is a unique work of art. The tanzanite-and-diamond brooch at top, right, was fashioned of fused and fabricated gold. The work of these artists, along with that of 117 other craftspeople, will be featured in the 16th annual Smithsonian Craft Show, on view April 23-26 at the National Building Museum in Washington, D.C. Noted for its eclectic mix of high-quality studio arts, the show has won recognition as the nation's most prestigious juried exhibition and sale of contemporary crafts. —*Diane M. Bolz*

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SMITHSONIAN HIGHLIGHTS

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(THROUGH April 12) George and Martha are coming home, and they're not alone. The traveling road show of Smithsonian treasures ends its two-year tour with a special exhibition that brings together a selection of objects drawn from all of the Institution's museums. Highlights include George and Martha Washington's portraits, Lewis and Clark's compass, Muhammad Ali's boxing gloves, and the ruby slippers worn by Judy Garland in *The Wizard of Oz*.

Special April Exhibitions, Events

SMITHSONIAN CRAFT SHOW

The annual exhibition and sale, sponsored by the Smithsonian Women's Committee, will be held April 23-26 at the National Building Museum, 401 F Street, N.W. For hours and admission fees, call 202-357-2700. See page 26.

NATIONAL AIR AND SPACE MUSEUM

Star Wars: The Magic of Myth (through November 1) Exhibition commemorating the 20th anniverary of the *Star Wars* trilogy features original props, models, costumes and artworks from the films. Free timed same-day tickets are available at the museum's ticket desk, on a first-come, first-served basis. Advance tickets are available through ProTix for a service charge of $2.25 per ticket (1-800-529-2440). For general information, call 202-786-2122.

NATIONAL MUSEUM OF AMERICAN HISTORY

Between a Rock and a Hard Place: A Dialogue on American Sweatshops, 1820-Present (April 22-September) Installation examines the history of sweatshop production in the United States.
Ellington Art Show (April 24-May 31) Annual art exhibit presents the work of Washington, D.C. students.

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NATIONAL MUSEUM OF NATURAL HISTORY

Janet Annenberg Hooker Hall of Geology, Gems and Minerals New permanent gallery showcases the National Gem Collection and takes visitors from the depths of a copper mine to the far reaches of the Solar System.
In Search of Giant Squid Permanent exhibition takes a look at the world's largest invertebrates.

NATIONAL ZOOLOGICAL PARK

The Birds of Paradise Lost New permanent display explores the work of Smithsonian ornithologists on the origins, paleontology and conservation of the birdlife of the Hawaiian Islands.

NATIONAL MUSEUM OF AFRICAN ART

A Spiral of History: A Carved Tusk from the Loango Coast, Congo (through April 26) A 19th-century carved ivory tusk reveals an African artist's visual conceptions about history.
The Poetics of Line: Seven Artists of the Nsukka Group, Nigeria (through April 26) Works by seven contemporary Nigerian artists inspired by Igbo culture.

FREER GALLERY OF ART

Japanese Art of the Meiji Era (1868-1912) (through April 26) Paintings, drawings, ceramics, lacquer, metalwork and cloisonné from the Meiji era.
An Invitation to Tea (through April 26) Objects from Japan, Korea, China, Turkey and Vietnam focus on the centuries-old Japanese tea ceremony.

ARTHUR M. SACKLER GALLERY

Ikat: Splendid Silks from Central Asia (April 26-September 7) Exhibition show-

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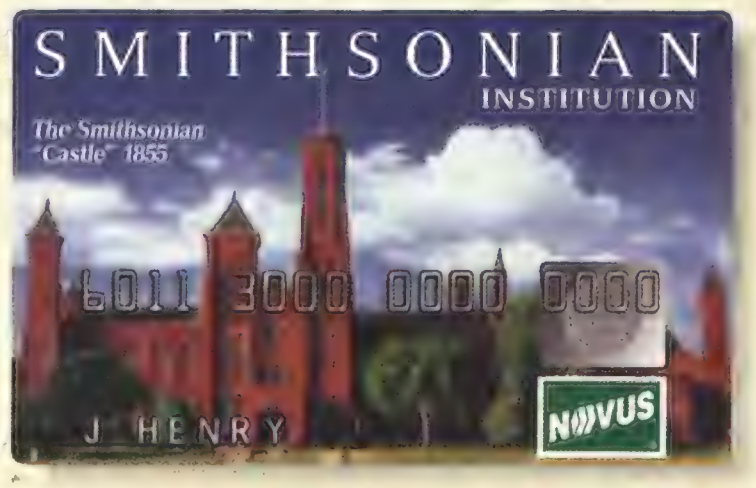

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cases 19th-century ikat textiles, noted for their vibrant colors and bold designs.
Khmer Ceramics (runs indefinitely) Rare glazed vessels from the 9th- to 14th-century Khmer Empire.

HIRSHHORN MUSEUM & SCULPTURE GARDEN

George Segal, A Retrospective: Sculptures, Paintings, Drawings (through May 17) Exhibition featuring the work of the New York-based sculptor includes key examples of his signature white-plaster figurative tableaux.
Directions—Kiki Smith: Night (through June 21) New works by the American artist explore the enduring yet fragile systems of the natural world.

NATIONAL MUSEUM OF AMERICAN ART

Posters American Style (through August 9) Exhibition presents poster graphics that reflect the concerns, issues and cultural aspects of American life from 1895 to 1995. See page 77.
Time Out! Sports in Art (through May 31) Temporary display celebrates sports as envisioned by a variety of artists.

RENWICK GALLERY

Inspiring Reform: Boston's Arts and Crafts Movement (through July 5) Exhibition examines Boston's contribution to the Arts and Crafts movement—books, ceramics, furniture, jewelry, textiles.

NATIONAL PORTRAIT GALLERY

Celebrity Caricature in America (April 10-August 23) Show looks at the craze for portrait caricature that swept America between the world wars.
George C. Marshall: Soldier of Peace (through July 12) Paintings, photographs and memorabilia.

ARTS AND INDUSTRIES BUILDING

Three Generations of African American Women Sculptors (April 13-September 30) Featured artists include Mary Edmonia Lewis, Meta Vaux Warrick Fuller and modern-day sculptors Selma Burke and Elizabeth Catlett.

Mid-19th-century wall hanging with repeating palmette and peacock-tail motif is in the Sackler Gallery's "Ikat" show.

Discovery Theater Live theater for young audiences. For information, call 202-357-1500 (voice or TTY).

ANACOSTIA MUSEUM

Man Made: African American Men and Quilting Traditions (through June 28) Exhibition features 50 traditional and contemporary quilts made by African-American men.

HEYE CENTER, NATIONAL MUSEUM OF THE AMERICAN INDIAN

[NEW YORK CITY]

Memory and Imagination: The Legacy of Maidu Indian Artist Frank Day (through May 3) Paintings by the self-taught Native American artist (1902-1976) are accompanied by photographs and Maidu cultural objects.

COOPER-HEWITT, NATIONAL DESIGN MUSEUM

[NEW YORK CITY]

The Jewels of Lalique (through April 12) Art Nouveau jewelry and objets d'art by artist-jeweler René Lalique.
Arquitectonica: The Times Square Project (through May 10) Exhibition focuses on the Miami-based architectural firm's vision for a new multiuse complex in Times Square.

EXHIBITION CATALOGUES

Catalogues available currently include:
Posters American Style ($35 cloth)
Inspiring Reform: Boston's Arts and Crafts Movement ($69.95 cloth)
Memory and Imagination: The Legacy of Maidu Indian Artist Frank Day ($24.95 paper)
New Traditions from Nigeria ($49.95 cloth)
To order, send check or money order to Smithsonian Museum Shops, P.O. Box 1140, Newington, Virginia 22122. Include 15 percent of purchase for postage and handling (minimum, $4.50).

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To become a member, or for fee and ticket information, call 202-357-3030.
April events include:
The Murder of Tutankhamen—A True Story (April 20; 8 P.M.) Famed Egyptologist Robert Brier unravels the mystery.
An Evening with Cokie Roberts (April 29; 8 P.M.) The noted ABC news correspondent explores significant issues confronting women today.

SMITHSONIAN INSTITUTION TRAVELING EXHIBITION SERVICE

SITES organizes and circulates exhibitions to cities throughout the United States and abroad. To sponsor a show in your community, write to: SITES, Smithsonian Institution, Washington, D.C. 20560. Here are some April exhibitions:
◆ Lawrence, Kansas (April 11-June 7) *Mysterious Manatees*, Natural History Museum, University of Kansas.
◆ San Carlos, California (April 11-May 24) *Women and Flight*, Hiller Aviation Museum.

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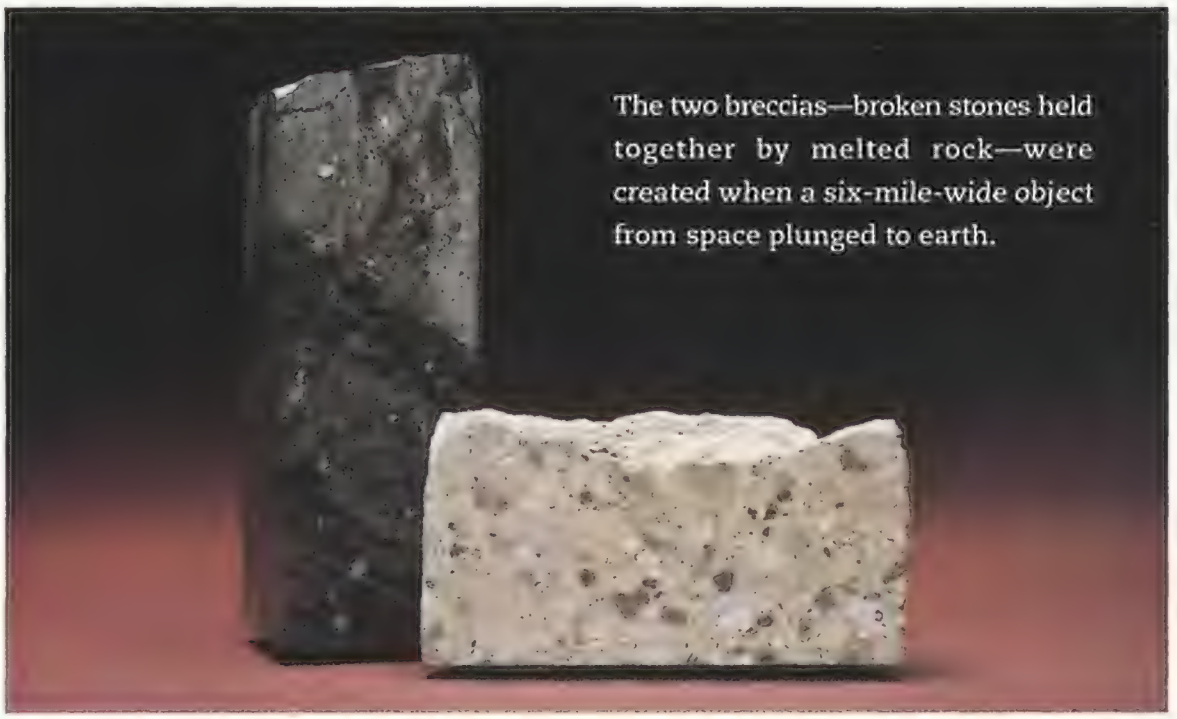
THE OBJECT AT HAND

A Tale of Two Rocks

RETRIEVED FROM A MILE BENEATH THE EARTH'S SURFACE 65 MILLION YEARS AFTER THEIR CREATION, THEY BEAR WITNESS TO A CATACLYSM—AND THE DEATH OF THE DINOSAURS

BY VALERIE JABLOW



The two breccias—broken stones held together by melted rock—were created when a six-mile-wide object from space plunged to earth.

THEY ARE TWO SMALL CHUNKS OF humble gray rock. Amid the glittering array of exhibits in the Hall of Geology, Gems and Minerals at the National Museum of Natural History (NMNH) they are easy to overlook. Yet they bear witness to a shattering event in the life of our planet, and to one of the hottest scientific debates of this century—exactly what did (or did not) do in the dinosaurs.

The rocks are breccias, their name derived from the word Italian stonemasons use to describe bits of broken stone held together like pebbles in concrete. Today we know they were blasted into existence about 65 million years ago when an object more or less the size of Washington, D.C. crashed to earth near what is now Mexico's Yucatán Peninsula.

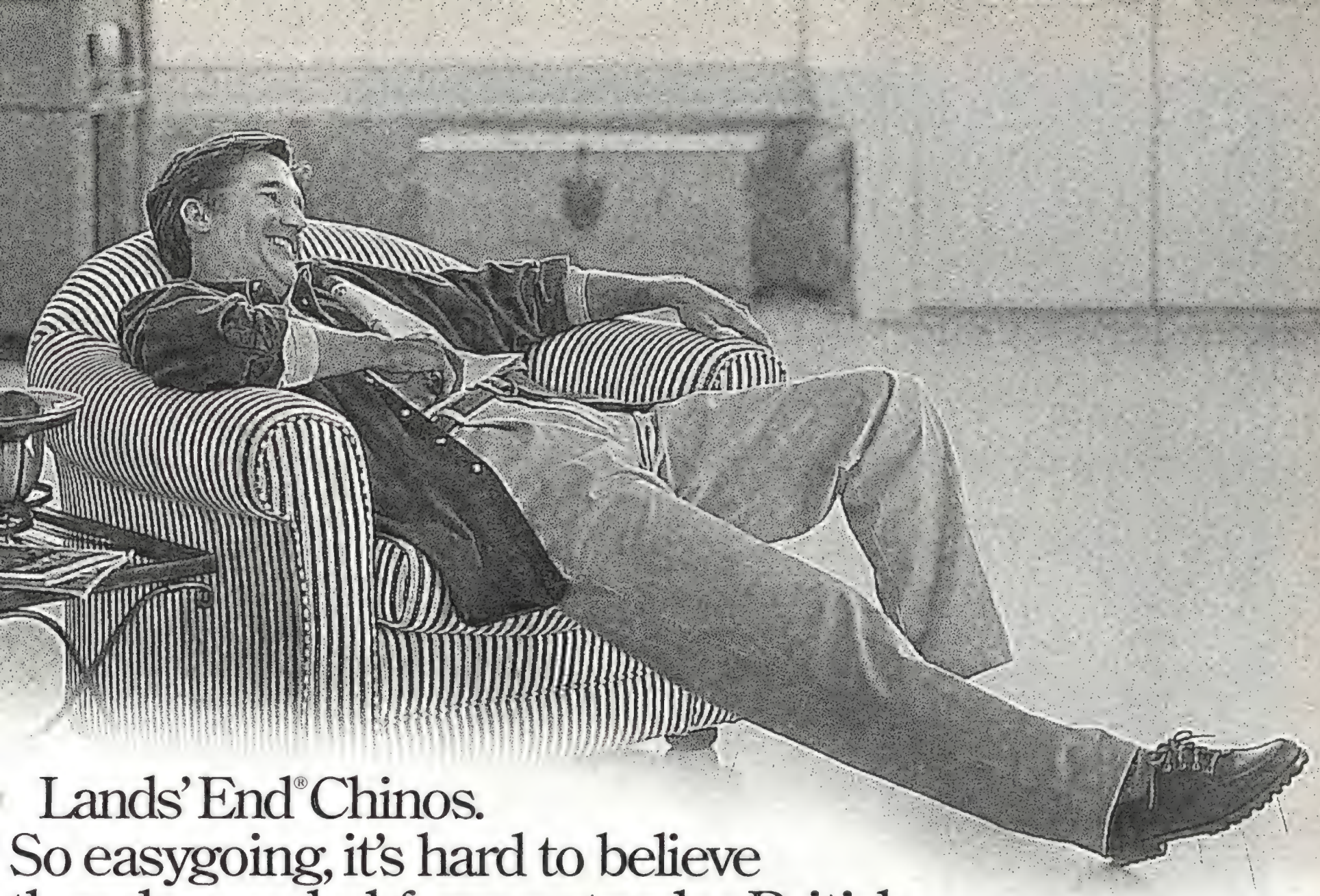
The asteroid (or comet—scientists aren't sure which) weighed as much as one trillion tons and traveled at up to 35 miles per second—the record for a jet is only a little more than half a mile per second. Plunging several miles into the earth's crust after crashing into a shallow sea, it blasted billions of tons of sand, rock, dust and seabed through the atmosphere and all around the world. It vaporized, ejected, melted or pulverized the rock beneath it, creating a crater more than 120 miles in diameter. Left behind in the crater were hundreds of cubic miles of shattered and melted rocks, including these breccias.

The crater, now known as Chicxulub (CHEEK-shoe-lube), was not the only effect. There were fires worldwide, a tsunami more than half a mile high and storms of acid rain. In the resulting devastation, the sky went dark. The sun did not shine through for perhaps a year because of a killing cloud cover of dust. As much as 70 percent of all plant and animal species on earth appear to have been wiped out—including, most spectacularly, the dinosaurs, whose disappearance would long puzzle modern scientists. The two breccias are pieces of evidence of that earth-wrenching but only lately understood event. And they have figured in the great scientific detective story that resulted: the discovery of the crater itself, some 65 million years after it was formed.

Breccias are fairly uncommon. They can be created slowly on the earth's surface over eons during which rock fragments are cemented together in the sediment in which they lie. Volcanoes can do the job somewhat faster, as rocks are caught up in molten lava heated to nearly 2,000 degrees F. But when asteroids (or comets) collide with the earth, they manufacture instant breccias on impact. At Chicxulub, the impact produced pressures in the rock several million times greater than what we are experiencing right now in the air around us. Temperatures may have reached 18,000 degrees F—by comparison, the sun's surface is a chilly 10,000 degrees F. The rocks that were hit directly were instantly vaporized, and the underlying rock was rapidly melted or pulverized.

To understand the story that the two NMNH breccias tell about the crater and its significance, you have to go back in time about 20 years, hardly more than an instant compared with the 65 million that have elapsed since the asteroid did its work.

At that time only a few scientists theorized that the massive biological extinctions (suggested by fossil remains) at the end of the Cretaceous period were caused by the impact of an extraterrestrial object. It was regarded as a radical theory. Most scientists figured that the dinosaurs



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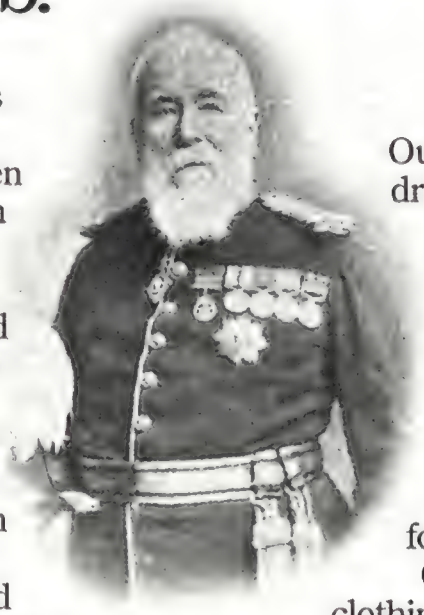

Actually, they're descended from his pajamas.

It was 1846. And Lt. Harry Lumsden sweltered in the heat of the Punjab, on India's northwest frontier. His scarlet tunic – a heavy felt – gave no relief.

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And casual clothing has never been the same, since.

How khakis turned into chinos, and then into Lands' End Combed Cotton Chinos – *that* takes explaining.

Combed first, then dunked

The fabric in chinos has always been a woven cotton twill – a fabric that's medium in weight but sturdy.

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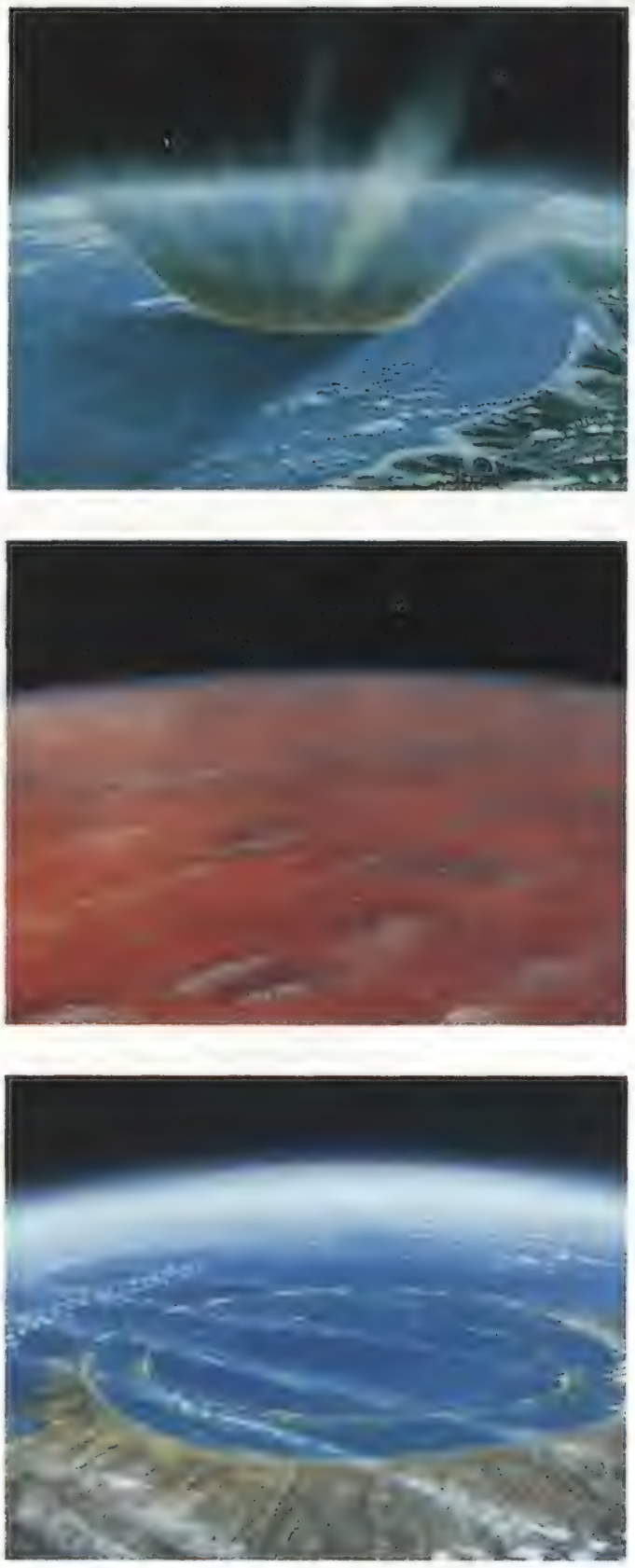
had been done in by a change of climate or a change in sea level. Others thought it unlikely that in such a large, empty solar system, an asteroid or comet could actually have managed to hit the earth—much less have wreaked global destruction on impact.

Of course, there were intriguing clues and searches in support of the monster asteroid theory. One involved iridium, an element rare on the earth's surface but more abundant in asteroids. By examining the amount of iridium in rock layers in Italy, Denmark and New Zealand, the Alvarezes, a now famous father and son research team, were able to deduce that a huge asteroid had struck the earth somewhere. Luis Alvarez, a physicist, and his son Walter, a geologist, had combined their knowledge, along with that of others, and released what amounted to a scientific bombshell. It was 1980, and the Alvarezes' asteroid theory suggested that somewhere there should be an enormous crater at least 100 miles in diameter. The impact sites of many smaller asteroids were well known. Even allowing for changes in the earth's crust, which could have obliterated the crater if the asteroid had fallen in the ocean, or buried it under 65 million years of sediment if it had fallen on land, skeptics wanted to know how so huge a relic could have remained undiscovered. Where, in short, was the smoking gun?



The sequence of events 65 million years ago begins with the devastating impact (top), which kicks up a dust cover thick enough to block out all sunlight (middle). At bottom is the new crater as it might have looked 1,000 years later.

Curiously enough, the two NMNH breccia samples had already been wrested from the earth and stored in Mexico, not for science but for purposes of commerce. They came from sample cores drilled during the 1950s and '60s by the Mexican national oil company, PEMEX, not far from the northern Yucatán hamlets of Chicxulub Pueblo and Sacapuc.

They looked a lot like breccias of volcanic origin: melted rock holding together angular chunks of unmelted rock. Their presence in the drill cores did not bode well for the oil company's exploration of the area, since volcanic rock usually means that oil, even if present, is not easy to extract. The area from which the cores were taken did show a strange feature unlike that of a volcano—it was apparently part of a huge, semicircular ring with a high gravity field at the center. But because so few scientists took seriously the likelihood of a large asteroid's impact on earth, it seemed eminently sensible to assume the breccias were the products of a volcano.

In 1978 a young geophysicist named Glen Penfield, who was working with PEMEX, found himself assigned to fly over the Gulf of Mexico. Using a magnetometer, he was to measure the magnetic field of rocks on the Gulf floor—specifically off the coast near Chicxulub Pueblo. Like the findings of earlier PEMEX geologists, Penfield's were intended to map out the rock composition beneath the surface and determine the likelihood of finding oil.

But what Penfield's magnetometer let him see was very odd. More than a mile below the surface of the Yucatán Peninsula, and for 70 miles out into the Gulf of Mexico, was a saucer-shaped underground structure with a magnetic field different from that of any known volcanic terrain. It also had a most un-volcano-like symmetry. Put together, the old land data and the new underwater data indicated the existence of a huge ring, about 120 miles in diameter, half on land, half under the Gulf of Mexico. It was ten times the size of any volcano, with an upward bulge at its center similar to those seen on known—though much smaller—impact craters.

Penfield and PEMEX geophysicist Antonio Camargo-Zanoguera concluded that it could not be the result of a volcano; it was probably an impact crater. But proving that scientifically was a major problem. For one thing, the data upon which their conclusion rested were held in confidence by the oil company. Worse yet, the warehouse in Mexico where all the core samples were supposed to have been stored and catalogued had burned down, apparently

destroying everything.

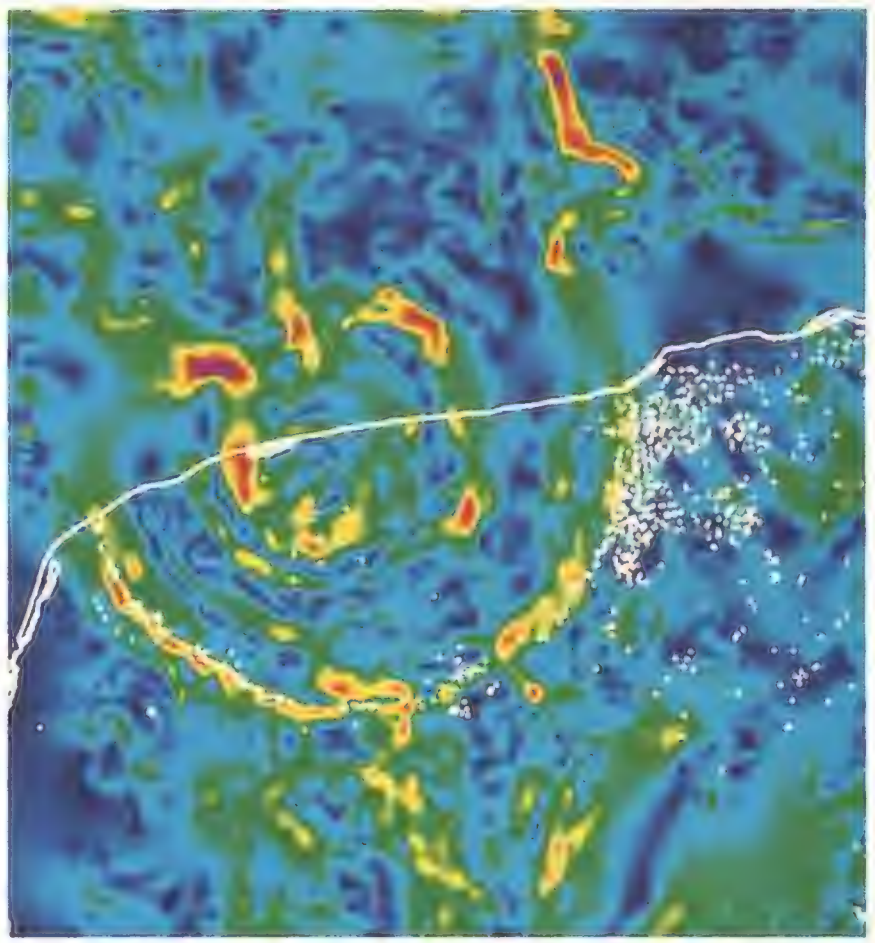
Just why those core samples and the breccias they contained were so important was the result of some relatively recent research involving the effects of known asteroid impacts upon assorted rocks. It was only in the 1960s that scientists discovered that one of the most important of these effects is the production of what is known as "shocked" quartz. Common in earth's crust, quartz is present in most impact breccias (including the ones on display at NMNH). Normally, quartz crystals are unmarked. But when an asteroid hits the ground, its powerful shock waves, passing through the tiny quartz grains at a rate of three to six miles per second, leave a unique, indelible mark: microscopic parallel lines scored through the quartz, like three-dimensional cross-hatching. The presence of these features provides certain proof of an asteroid impact.

It wasn't until spring of 1990 that Penfield got a call from a graduate student, Alan Hildebrand, who had examined a 65-million-year-old rock layer in Haiti, only 300 miles from the Yucatán, and determined that the still-hypothetical asteroid impact of that time must have occurred somewhere around the Caribbean. Now Hildebrand wanted to see if he and Penfield could complete the puzzle by locating rock samples from Penfield's Chicxulub structure.

Working determinedly, they began their search for samples. By marvelous chance, they found that a few breccia samples, part of the original oil drill cores, had been distributed here and there in Mexico and the United States, thus escaping destruction in the Mexican warehouse fire. Penfield and Hildebrand were fortunate enough to get hold of a few of these, including one breccia from the 14th core of the PEMEX drill site called Yucatán 6. And that did it. Shocked quartz samples from the Yucatán 6 breccia clinched the fact that Penfield's underground saucer was not a volcano, but rather an asteroid impact crater—the elusive smoking gun.

Within a year, it turned out that many of the supposedly destroyed Chicxulub area cores were available. In the kind of coincidence that one might expect in an Indiana Jones adventure, a scientist at PEMEX, intrigued by the anomalous structure from which the cores were taken, had stored the cores in an office in Mexico City for eventual study. The breccias on display at NMNH are from that cache.

Today, most of those scientists who still think that the decline of the dinosaurs occurred gradually also grant that the great asteroid hastened the end of their existence—and the sudden birth of a very different world.



The Chicxulub crater site on the Yucatán Peninsula (top) spans land and water. A gravity image (above) reveals the bull's-eye of the crater. The scattered bright dots onshore represent sinkholes, now used for cave diving (see p. 94).

To understand why, you have only to imagine the effect on the modern world of a similar asteroid impact. Apart from the incredible physical destruction—and the human violence that might ensue—imagine the earth with the sun blocked out for a year: there would be no harvests, and deprived of the warmth of the sun, the earth would grow dramatically colder, perhaps by as much as 30 degrees.

The extremes of temperature and pressure that created these breccias literally changed the earth. Millions of years later, the breccias are a reminder of the new kind of life that resulted, one in which large mammals like us could evolve because dinosaurs were extinct. Like these rocks, we might not be here today if it weren't for the asteroid that formed the Chicxulub crater.

Olga Hirshhorn and The Art of Living

BY MICHAEL KERNAN

"OH, THERE'S THAT BARYE BRONZE OF THESEUS AND THE centaur—it was in our garden . . ."

Olga Hirshhorn is strolling with me through the museum the Smithsonian built on the Mall to house her late husband's remarkable collection of art. She comes here a lot. It's like old times.

"The thing I notice is how nice the patina is here on the sculptures. We used to hire college kids to polish them, and they did their best. But it's so much nicer here," she said.

It has been a long trip from Olga Zatorsky's modest home in Greenwich, Connecticut, where she was the youngest of three children in a Ukrainian blue-collar family, to this spectacular museum. It's even a far cry from her second life as Mrs. Cunningham, the teenage wife of her high school English teacher, the mother of three sons at 25.

She helped support the family with a series of little businesses run from the house: a children's swimming class, then a day camp, nursery school and baby-sitting service. By the time she and her first husband separated, all this had evolved into Services Unlimited, an employment agency.

And one day in 1961 the phone rang in her office. She answered it herself. It was Joseph Hirshhorn. "I've just bought the Sinclair-Robinson house here in Greenwich," he said, "and I'm looking for a chauffeur."

By then, Hirshhorn, a Brooklyn poor boy and high school dropout, was a multimillionaire who owned literally enough art to fill a museum.

Hirshhorn soon called again, for a cook, then a maid, then another maid. He liked Olga's efficiency, her independence and her voice. He called her a lot, like ten times a day. One day he asked, "Say, Mrs. Cunningham, how old are you?" She said she was 41. And came right back at him: How old was he? Sixty-two, he replied.

Later he asked, "Say, how tall are you?" Five feet even, she replied. This was fine with him: he was 5 feet 4. After they had dated awhile, he said, "If you lose ten pounds, I'll marry you." "I took a month to take it off," Olga confides. They were married in 1964. From then until his death by heart attack in 1981 they were a devoted couple. "My life revolved around him," she said once.

Already she had the collecting bug, mostly Victorian furniture and jewelry, hats, haircombs and such.

"But Joe brought me into a very exciting world," she told me. And this museum was part of it. Yet she made it her own, and her unassuming ways have endeared her to the guards, who greet her as an old friend.

Hirshhorn's tiny Washington "Mouse House" contains 176 artworks.

Now we strolled among some of the famous works that were once household fixtures to her.

"Oh look," she exclaimed, "this portrait bust of Madame Renoir; that was in our dining room, I remember exactly where . . . And there's the Rodin, the *Man With the Broken Nose*; it was upstairs in our Greenwich house. Oh, and there's that Picasso head of a jester; Joe had two of these, one on our mantel and one in the museum.

"We had a big Rodin in the garden at Greenwich. It was

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a long house, with a long, narrow entrance gallery. And a huge Maillol nude at the front door with her hands outstretched; in the winter she seemed to hold two snowballs. It's really kind of fun to see all these things here."

Carefully checking a large Rodin work, she wonders if those splotches could be bronze disease. "I've learned to look for that," she says. "I was so much aware of it when these pieces were in our garden."

The garden. That would be at the Greenwich house. There was also the place in Cap d'Antibes on the French Riviera, where they hung out with painter Marc Chagall, Matisse's son, Pierre, Giacometti, Miró and the Picassos . . . the real-life Picassos, not the paintings. "Picasso gave me a fine ceramic tile he had done with a picture of Jacqueline on it. We knew them the last ten years of his life, and I resent what the new books say about him being an awful person. Jacqueline couldn't live without him."

Joseph Hirshhorn didn't speak French, but he got along just fine with the great artist. There is a picture of Picasso clowning around in Hirshhorn's jacket and tie, and once the painter put his magic signature on a dress that Jacqueline had made for Olga.

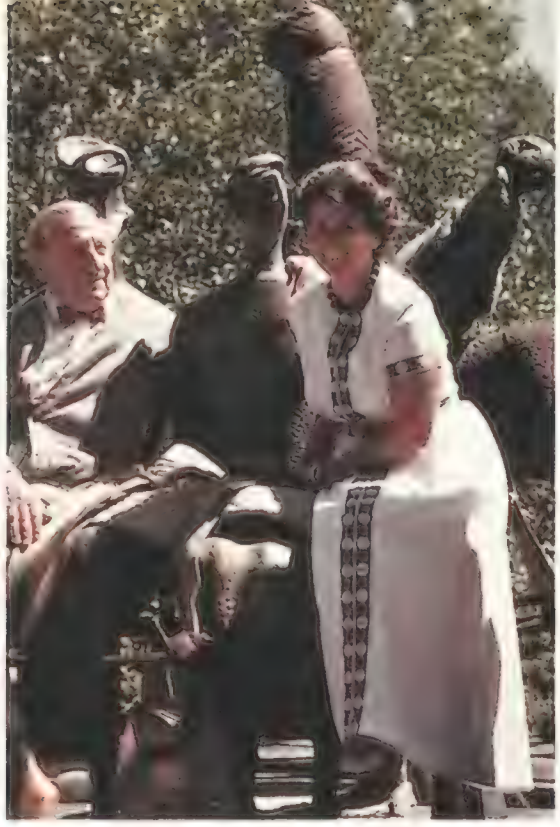
Today, Olga resides in Naples, Florida. She spends a month each spring and fall in her tiny "Mouse House," as she calls it, in Washington, absolutely crammed with paintings and sculpture—to be precise, 176 pieces ranging from Picassos, de Koonings, O'Keeffes, Giacomettis and Nevelsons to an oil by the senior Robert De Niro.

In January she visits Cuba, in affiliation with the Center for Cuban Studies in New York. She summers at Martha's Vineyard in a place she bought after Joe's death.

In October she travels. Last year it was a Smithsonian tour of Eastern Europe, and before that a rented house in Italy ("these wonderful people took care of me because I was alone"), and before that Russia ("I broke my wrist dancing in Leningrad") and Portugal. She is looking at Sicily now.

Travel was a major part of life with Joe Hirshhorn. A restless soul, he fought all his life for recognition, and he knew it was the art that would bring it. She was with him when he was courted for his collection by the Arts Council of England, Nelson Rockefeller, the governor-general of Canada and the mayor of Jerusalem.

The couple hobnobbed with O'Keeffe, Larry Rivers, Man Ray, Calder and so many others that she hesitates to name them lest she leave someone out. But the working girl had to assert herself: she did a couple of sculptures, took drawing classes, painted watercolors. Finally, she said she wanted to buy some art on her own.



The Hirshhorns, 1974, take a parting shot with art destined for the museum.

"Joe said, 'Don't I give you enough?' and I said, 'Well, I never had the pleasure of making my own choice.' So I bought a Josef Albers. I paid $2,000. I remember thinking that two years earlier if someone had predicted I'd pay $2,000 for an 18-inch painting that was just a square within a square within a square, I would have said, 'Ridiculous, a child could do that.'"

Later he gave her $5,000 to buy clothes. She bought a piece of sculpture instead. Eventually she amassed a respectable collection of smaller works, which she is giving to the Corcoran Gallery of Art. "I've given art to almost every museum in Washington," says Hirshhorn, who tries to visit each museum whenever she is in town.

"Joe was a wonderful man to be married to," she reminisces during our tour. "He was lots of fun, loved to dance, loved the movies, had a sense of humor. I met him at the best time in his life, when he really wanted to settle down. We traveled a lot, went on picnics, went fishing."

The uncomplicated Joe Hirshhorn remained close to his fourth wife. She converted to Judaism because she wanted to be buried beside him. He was delighted when she took him to McDonald's for a birthday lunch.

In 1981, coming back from a performance of *Annie* at the Kennedy Center, he collapsed outside their Washington home and died in her arms.

She told me, "It was hard. I thought my bubble had burst, and it had. But you have to learn to make a life of your own."

In her quiet way, Olga Hirshhorn has done just that. She took up skiing at 64 ("It was great: the lift was free for senior citizens!") and has given it up only this year. She still rides horseback now and then, jogs, swims in her Florida pool and rides her bike five to ten miles daily. A supporter of several women's groups, this month she is serving as a delegate to the International Women's Solidarity Conference being held in Havana, Cuba.

Meanwhile, there are the three sons, one a sculptor and Skidmore professor, another a retired Connecticut water resources expert, the youngest a retired member of the New York Stock Exchange, and the five grandchildren. Plus, Hirshhorn serves on the Corcoran board and supports various other museum projects and art associations.

And any time she feels lonely for those great days, she can always roam through the Hirshhorn Museum and look at all the famous art that used to be in her dining room, and remember the people who made the art, and what they said sitting around under the olive trees one sunny afternoon on the Riviera, and the sound of their laughter.

Edgar Degas, *Before the Race* (detail), 1871–1872, National Gallery of Art, Washington, Widener Collection

Degas *at the* Races

The great impressionist's fascination with the world of horses and racing, at the ***National Gallery of Art, April 12–July 12, 1998.***

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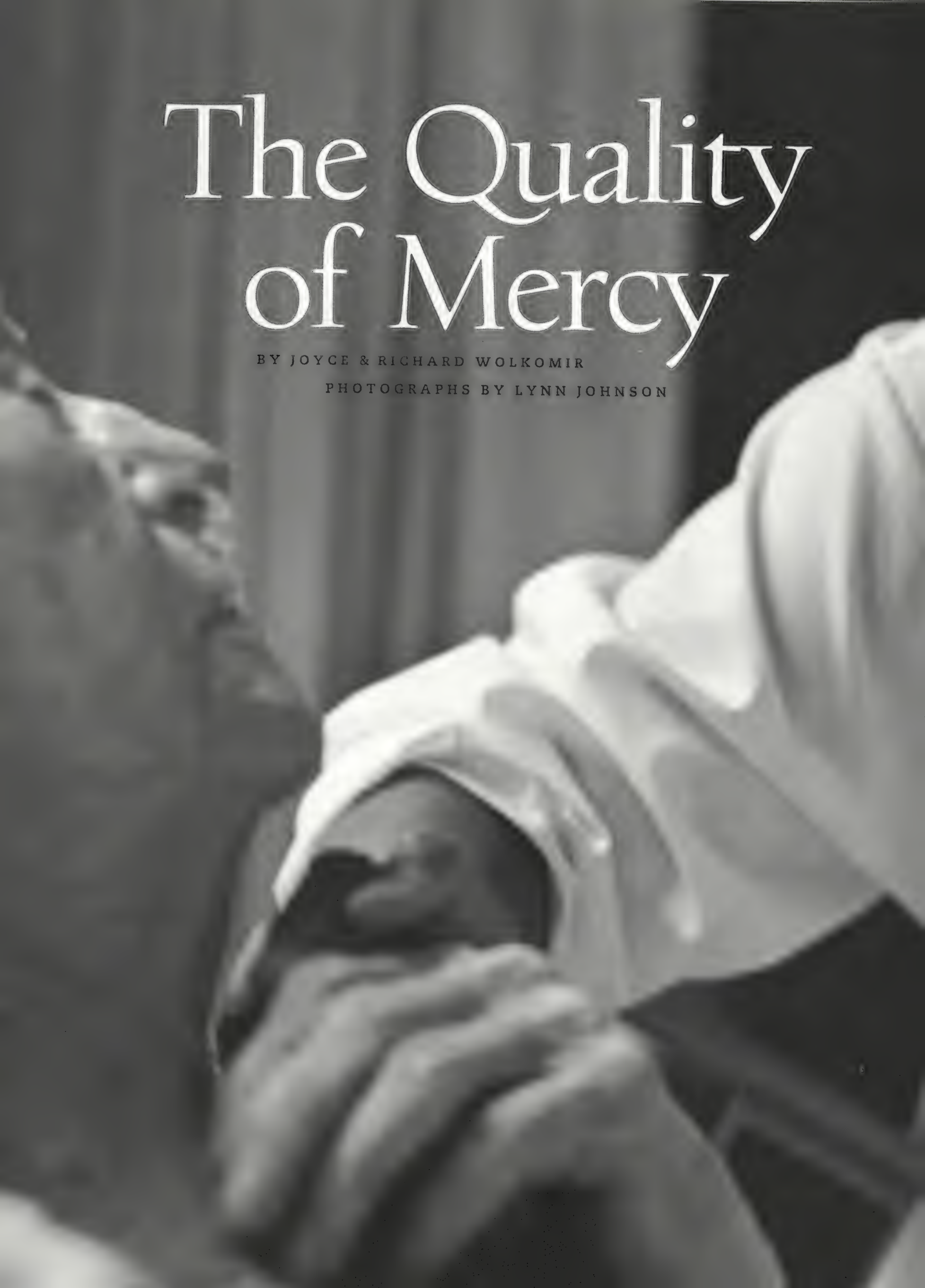
The Quality of Mercy

BY JOYCE & RICHARD WOLKOMIR

PHOTOGRAPHS BY LYNN JOHNSON



At a small hospital in Vermont, nurses practice medicine as an art, marshaling compassion and skill in equal measure

IT IS STILL DARK OUTSIDE HER WINDOW. *But she has been unable to sleep. Her fear is now a continual inner roar. "I don't want to die," she thinks.*

She cannot see the flag outside, drooping in the dark, but she knows it is inscribed "Central Vermont Medical Center." She knows every detail of the view from her window, every item in her room—the blue pump, which has infused her blood with chemicals so toxic the nurses changing the bags must wear goggles and protective gowns; the bedside tray, where they put the food she does not eat; the wall chart showing each day's blood-test results, as the chemotherapy eats away her bone marrow. She is losing her hair.

Two weeks ago, she thought she had a case of the flu. Her husband persuaded her to see a doctor. That evening the doctor called. "It's bad," he said. A chilling pause. "You have acute myelogenous leukemia—you have to go into the hospital tonight."

She had been healthy, an educated professional. A nonsmoker, a nondrinker. Fruits. Vegetables. Exercise. She looked a decade younger than her 54 years. But she had tumbled into this alternate universe, the planet of the sick.

"Debby will be here soon," she thinks. "And this evening, Alma will come." She comforts herself, thinking of her nurses. Today Dr. Valentine will do a biopsy. It will show if the chemotherapy has put her into remission. If it has, she will have a chance to continue living. Her chance will be 35 percent. "I don't want to die at all," she thinks.

Evening nurse Alma Mueller offers a sip of water to a postoperative patient.

As nurse Deborah Farnham monitors her patients' conditions, she also comforts those in her care in countless different ways—administering a soothing back rub, shampooing a bedridden woman's hair, giving a gentle footbath.

6 A.M.—"Good morning," the night nurse says. She rests a reassuring hand on the leukemic woman's thin shoulder. "I'm going to draw blood."

Headlights sweep into the parking lot as the day-shift nurses arrive at the hospital, a red-brick fortress atop a ridge. Fog fills the valley, hiding the little state capital, with its 8,000 souls.

It is a ritual, this drawing of blood, the night nurse's final chore. "I'll get this right down to the lab," says the nurse, injecting the newly drawn blood into a test tube. Its purple cap signals lab technicians to perform a complete blood count, or CBC.

It worries the patient, what portents Dr. Valentine might see in the accounting of her blood's neutrophils, lymphocytes, hemoglobin, erythrocytes, platelets. But today she has a sharper worry.

Will Debby be here, she wonders, when Dr. Valentine does the biopsy? He is her wizard. He fights the cancer in her blood with potions, which she calls "my dangerous chemical companions." He transfuses her with platelets, so she will not bleed. Infections flare. He douses them. But, mostly, it is the nurses she sees. They are the doctor's proxy eyes, ears, hands. She has come to depend on the kindness of nurses.

Night shift. Day shift. Evening shift. Two South—the medical-surgical ward—possesses its own peculiar rhythms.

Nights are quiet, with muffled hacks and coughs. Sometimes she hears cries from patients who are old and unhappy. She arrived here an hour after her diagnosis. She was in shock, and so was her husband. Night nurses brought a cot so he could sleep in the room. And they were especially kind, she remembers: they even brought a mat for her pet corgi, so that he could sleep here, too.

It was the nurses who have taught her the elements of daily survival—how to guard against bleeding, after chemotherapy lowered her platelet counts. She must not rub her eyes or scratch the red rash on her legs, which chemotherapy had induced. She must be careful blowing her nose.

Mostly her day nurse has been Debby. On the evening shift, from 3 until 11, her nurse has been Alma.

6:45 A.M.—Day nurses, just arriving, have gathered around a conference table for Report. They listen to tapes recorded by the night nurses, updates on patients. They jot notes.

"In Room 237," says the voice on the tape, "the patient is 34, with spina bifida and draining wounds on his buttocks and thighs. . . ."

Deborah Farnham, brushing aside curly dark hair, dons the glasses usually dangling from strings around her neck and peers with brown eyes at her notes on the man with spina bifida. He will be her patient today. "In 234, a 96-year-old man, pre-op for surgery on an enlarged prostate impeding urination. . . ." "In 238, a woman with leukemia. Dr. Valentine will do a biopsy today. . . ." "A 79-year-old man, pneumonia. . . ." "In 239A, a 36-year-old woman with rhabdomyosarcoma, Dr. Valentine's patient. Receiving chemotherapy. . . ."

Debby has one more chore before she can visit patients. She must check their charts.

Two South's rooms run along the outside walls, offering views of the Green Mountains. At the ward's hub is an island of computer stations, workrooms, closets, a kitchenette. Here, too, is the desk where the charge nurse sits. Behind the charge nurse is the ward's nexus, a revolving

circular cabinet. Stacked inside, like books, are metal-jacketed files, each a patient's "chart."

Debby stacks five charts on the desk in front of her. Once again she puts on her glasses. Each chart tells the story of one of her patients.

It is through the charts, these critical records—accounts of medications dispensed, infusions, lab reports, surgeries, fevers—that physicians communicate with nurses. After reading nurses' comments, the physicians may scrawl into the chart changes in their patients' orders, for the nurses to execute. Debby is now scanning for new orders from doctors.

Dr. Valentine, she sees, has ordered a new intravenous (IV) antibiotic for the woman with leukemia. Debby is especially alert for such medication changes. "Meds" must be administered in precise doses, at particular times. Mistakes can be lethal. Nurses must sign off as they administer each dose, taking responsibility. Often, late at night, while her husband and children sleep, Debby lies awake, reviewing her patients. Did she forget anything? Sometimes she telephones the charge nurse, to make sure some detail of a patient's care is attended to.

In one of Debby's earliest memories, she is 4 years old, helping her mother—who wears a full face cast—drink through a straw. An auto crash has injured her head. After the accident, Debby and her mother lived in her grandparents' home, where Debby grew up. Her grandfather, a Yugoslavian emigrant, worked in a granite shed. Her grandmother worked at the Montpelier Steam Laundry, but she had yearned to be a nurse. Nursing became Debby's goal.

Once, as Debby programmed the leukemic woman's chemotherapy pump, the patient asked what attracted her to nursing. "I love taking care of people," Debby had said. "I always have." And she does not mind that her work—despite the high-tech gear and the life-and-death responsibility—requires services as humble as Jesus' washing of his disciples' feet.

She does not mind that her work—despite the high-tech gear and the life-and-death responsibility—requires services as humble as Jesus' washing of his disciples' feet.

7 A.M.—Room 236's bathroom floor is smeared with feces. It is the work of one of Debby's patients, a 79-year-old man with Alzheimer's disease, recuperating from gallbladder surgery. Nobody from the cleaning crew is around. And so Debby is on her knees, with towels.

Today will be hectic. Two South can handle a maximum of 40 patients: the count is already 36, with more due up from the operating room.

"Are you hungry this morning?" Debby asks her Alzheimer's patient as she takes his blood pressure. "I think so," he says. He looks distinguished, sitting in his chair. He has white hair. He resembles Robert Frost.

7:30 A.M.—Debby is at the rolling medicine cart, parked in the corridor. Each patient on her side of Two South has a drawer in this cart. In the hospital pharmacy downstairs, technicians are filling empty drawers with each patient's prescriptions for the next 24 hours.

Pharmacists mix potent chemotherapy drugs in a specially secured room, where the air pressure is controlled, so no toxic fumes can escape. They prepare other IV infusions in a "clean room," where the pressure is high, so that no contaminants can blow in.

This pharmacy stocks 1,700 types of drugs, but sometimes a rare drug must be rushed in by courier. For instance, the hospital stocks no snake antivenins, Vermont having virtually no venomous snakes. But it does stock drugs for people who poison themselves drinking antifreeze.

Debby is now leaning against the cart, her glasses back on, studying the Medication Administration Record, or MAR. By comparing the MAR with her own records, she can decide if she and the pharmacists disagree. Should a drug be given three times a day? Or every eight hours?

Serious disease. Debby well understands, can bring anyone down. Intelligence, education, social level—nothing matters. You are too weak to wash yourself. You are terrified.

Debby also checks to see who will need IV work. She notes again that the woman with leukemia will be getting a new antibiotic, and also IV nutrition. Good, she thinks. She has been noting in the chart that the patient is not eating, her appetite destroyed by chemotherapy. Debby is already planning when to set up the leukemic woman's IVs as she hurries to her next patient, a 96-year-old retired seafood merchant awaiting prostate surgery. "Let me brush your teeth," she tells him. He obligingly pops out his dentures into her hand. She wants to be everywhere, taking care of each of her five patients. But some need her more.

7:45 A.M.—"It's me!" Debby announces, walking into the room of the woman with leukemia. "Debby!" the woman says. "I'm so glad you're here." Debby is still knotting the strings of her breathing mask. Because chemotherapy has shut down the patient's immune system, visitors must wear masks in order to protect her from infection. "Let me wash your back and your feet," Debby says, after taking the patient's vitals. Such washing, she believes, offers comfort. But it also enables her to examine the patient closely, the skin, the nails, the feel of the muscles. "Your stomach is distended," Debby says. "How much of that antidiarrhea stuff have you been taking?"

Because the patient's platelet counts are low, she could hemorrhage internally. And because her white cells are down, she is vulnerable to microorganisms. Diarrhea could induce hemorrhaging. Alarmed, she has been gulping ever-larger amounts of an antidiarrheal medication. Debby suspects that she is overdosing and has plugged her digestive system. "Stop taking it, honey," Debby says. "I'll ask Dr. Valentine about it—your system is compromised; this medicine could make you sick."

Two weeks ago, when they first met, Debby sensed that this patient was highly intelligent. But she has been stunned by how little the woman knows about medicine. Nursing her, Debby has pondered how serious disease can bring anyone down. Intelligence, education, social level—nothing matters. You are too weak to wash yourself. You are terrified. Just being here, Debby believes, just showing the patient she cares, can be healing. As Debby works, the patient speaks of her impending biopsy. Debby knows she is afraid. "I'll be here for *that*," Debby promises. The patient thinks: *"I'm in good hands—at least, I'm in good hands."*

7:50 A.M.—Dr. John Valentine has dropped off doughnuts at his office, a Friday morning ritual. He tells his two partners and the nurses and the office staff it is his duty as the boss. But he likes the doughnuts himself.

A lean marathoner, 48 years old but looking 35, Dr. Valentine can afford the once-a-week doughnut binge. Otherwise, except for Wednesday drives to Boston with his wife, to watch the Celtics play—he is an ar-

Tending an elderly patient who has been admitted after falling down a flight of stairs, Farnham moves to quell the woman's anguish as quickly as possible.

dent fan—his days focus on lung cancer, pancreatic cancer, breast cancer, malignancies of every organ and tissue.

From his mountainside home it is a 20-minute drive to his office adjacent to the hospital. His four-wheel-drive vehicle ensures he makes it through blizzards and March mud. He has worked at major medical centers, but he likes sparsely populated central Vermont, where he might spend a Saturday afternoon chopping wood, with his beeper handy. He tells patients to call him whenever they are troubled by a symptom or a fear. He has mastered the knack of answering a wee-hours call about cancer, then dropping almost instantly back to sleep. Dr. Valentine is this region's sole oncologist.

At his office he pockets his stethoscope. In the hospital, just a few steps away, one elderly man is dying. It is the hard fact of cancer.

8 A.M.—Dr. Valentine punches in a code at the hospital's staff entrance. Inside, he pushes a button, alerting the staff that he is in the building. Today he has five patients on Two South. He is pulling their charts from the revolving file when Mickey McLaughlin, a nurse, tells him the dying man's family is gathering. "He can't live much longer—will you talk with them?" Mickey says. Dr. Valentine nods. It is painful. He does not always successfully keep a professional distance. As he puts it, "You hate to see your friends die." At the bedside, a middle-aged grandchild looks fondly at the old man. "But he's been a ball of fire," she protests. "He'll die soon," Dr. Valentine says. He gazes momentarily at his shoes. "I want you to know that I really like him," he says finally. "He's a great man to take care of, and I thank you for giving me the opportunity."

Back at the ward's central island, he studies his next patient's chart, then strides off to see a rugged-looking workman whose bladder cancer has spread to his prostate.

Next he visits the young woman. Uncomfortable sitting, she assumed she had hemorrhoids. It turned out to be a rare cancer, rhabdomyosarcoma. It is dangerous, Dr. Valentine has told her. Last month, before her first chemotherapy session, a surgeon performed the ultimate indignity, a colostomy. Mostly she wept. But she has 10-year-old twins. Focusing on them has stopped her crying. Her second chemotherapy is nearly finished. Dr. Valentine finds her sitting cross-legged on her bed, chatting with Debby Farnham. "This sweetheart," the patient says, pointing at Debby, "she was so good to me this morning—she washed my feet." He checks her groin, where the cancer had spread to lymph nodes. "That's really a lot better than it was," he says. "That's great."

Leaving, he allows himself a flash of optimism. After just two chemotherapies, the cancer has shrunk 80 percent. "And that growth in her lymph node is about gone," he tells Debby. The patient is responding unexpectedly well. "We'll be able to keep this under control for a good time—*at the very least*!" he says.

But he is already focusing on his leukemia patient. At the charts cabinet, he checks her blood counts for today. A normal white-cell count would be at least 4, meaning 4,000 cells per cubic millimeter of blood. Her count is 0.1, virtually zero. Fine, he thinks. Her cancer is a white-cell malignancy, and chemotherapy is doing its work.

He decides to go ahead with the

Patients' lives hang in the balance every hour of a nurse's working day: here, Farnham gathers medications. Before dispensing drugs, she screens prescriptions for errors.

biopsy. He is anxious to know the results himself.

8:45 A.M.—Dr. Valentine detests wearing the mask, but the nurses have put a "visitors must wear masks" sign on the leukemic woman's door. Debby is wearing her mask. The patient lies prone. Dr. Valentine numbs a patch over her pelvic bone. The biopsy needle has a hollow core and a sharp cutting edge. He pushes it through the numbed skin and drills it into the posterior iliac crest, the top of the pelvic bone.

It is the patient's first biopsy, and the instrument's grinding sensation is unnerving. Mostly, she fears what the biopsy might reveal. Debby is holding her hand.

When Dr. Valentine extracts the biopsy needle, it contains a sample of bone marrow the diameter of a pencil lead, an inch long. In the laboratory downstairs, technicians will take at least 24 hours for a complete analysis. Dr. Valentine is too impatient to wait. And so he takes a second sample, an aspirate, to get a preliminary reading. "I'm going to look at this right away," he says, mainly to himself. He packs his instruments and starts for the lab, where the slide will be prepared.

Debby is speaking to the patient soothingly. And she is still holding her hand.

9 A.M.—Dr. Valentine fits the slide, containing a drop of aspirate, under a microscope. He is apprehensive about what he might see. He must deal with the patient's emotions, and with his own.

He hopes to see a menagerie of different cell species in the marrow. Cells of various sizes. Nuclei of various sizes, various shapes. That will mean chemotherapy has cleared away the leukemia. But he might see sheet after sheet of the same cells, immature blasts. Cancerous cells remain eternally infantile, immortal, their numbers ever rising. In this patient's case, if the chemotherapy has failed, he will see blasts of the white cells called neutrophils. Dr. Valentine gazes intently into the microscope. Then he sits back. "I'll tell her," he thinks.

2:40 P.M.—Debby is going from room to room, checking on her patients one last time, telling them the evening nurse will be here shortly. She changes some of the spina bifida patient's bandages. And she gives the rhabdomyosarcoma patient a steroid drug to reduce swelling. Yesterday, when another nurse gave her this drug, it burned terribly. But Debby dilutes it, and injects it infinitely slowly. "That's not burning at all," the patient says. "I have magic hands," Debby says.

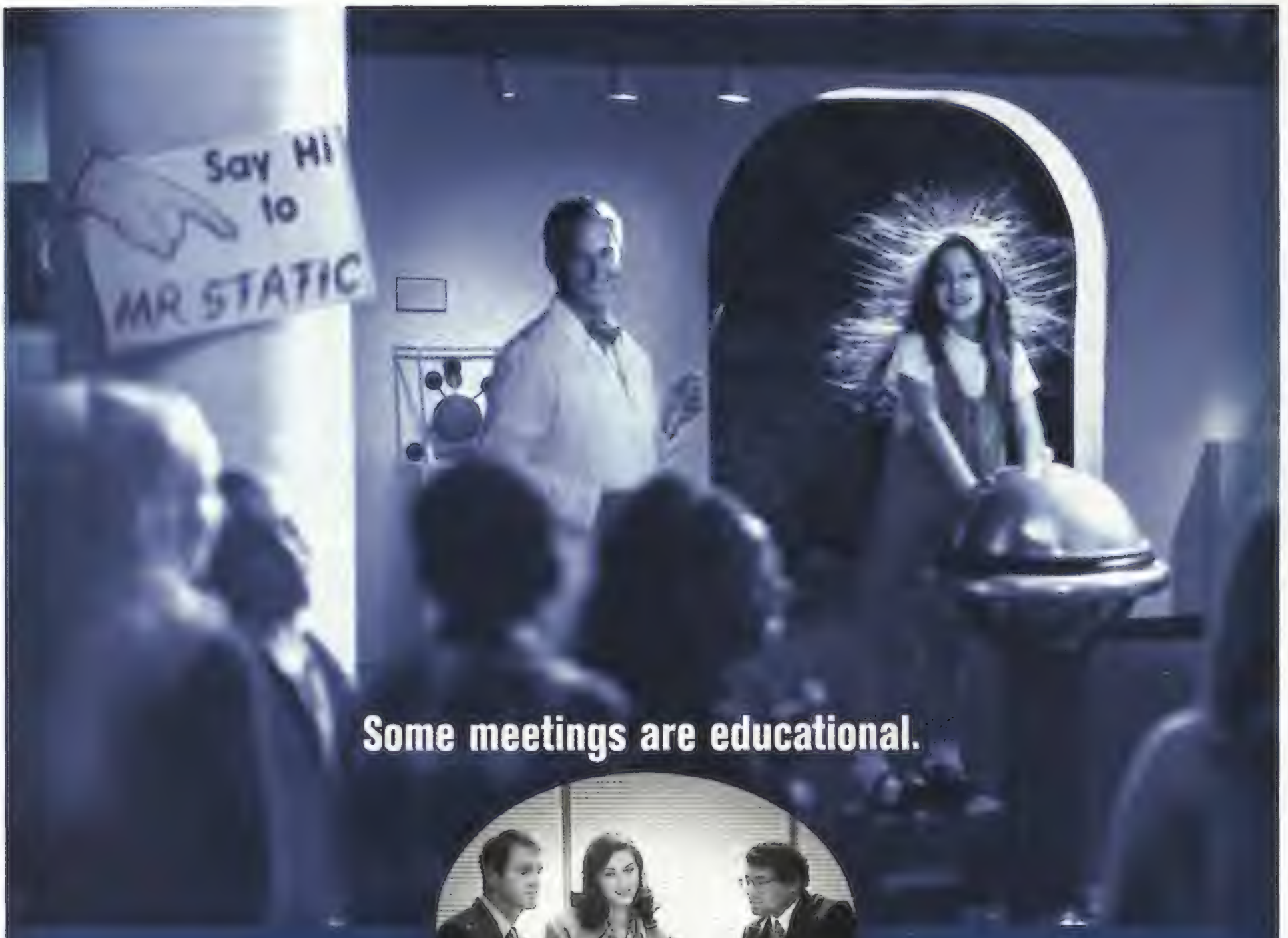
2:45 P.M.—Alma Mueller has come onto the ward. She wears a loose-fitting white-linen dress, amethyst-colored earrings, a purple head scarf. Something in her chin's angle hints at her former life as a dancer. Alma joins the other evening nurses in Report, to listen to the day nurses' observations on their patients. She takes extensive notes.

She will have the woman with leukemia tonight. And the young mother with rhabdomyosarcoma. A 90-year-old woman, anemic, has just come in from a nursing home for a blood transfusion. An elderly man has pneumonia. There is the young man with spina bifida and draining wounds. And there is a new patient, about whom little is known, who has arrived unexpectedly.

"I'll be a busy girl tonight," Alma mutters. Debby Farnham, too late to make a tape, rushes in to report in person. No improvement in the wounds of the spina bifida patient, admitted for a ruptured appendix, she says. Alma is writing rapidly. "Also, a man just came in, 56 years old, 85 pounds. He has only half a tongue, apparently from previous surgery for cancer," Debby says. "He's coughing up copious amounts of brown liquid, and his hygiene is extremely poor."

After Report, Debby resumes typing at a computer terminal, although her shift is over. Alma studies her patients' charts, her brow knitted. Ready, she gathers up a stethoscope and a digital thermometer. She knows exactly how they feel, her patients, lying in their hospital beds. Forty-five years ago, as a child in New York City, she began a lifetime of hospitalizations for sickle-cell anemia. She spent weeks at a time in the hospital. But the hospital also claimed her and redirected her life.

Her stepfather was an alcoholic. Her mother especially watched out for her bright, sick little girl, whose



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smile dazzled. At the hospital where little Alma spent so much time, the beds stood along the walls, separated only by curtains. All around her, people lay dying.

Alma read in the hospital. She had learned to read at age 3, going on to consume every book in her neighborhood library. One Christmas, when there was no money for presents, she found books in her house's attic that had been left behind by the previous owner. She decided which books should go to whom and wrapped them as presents. Her hospital pas-

time, besides reading and schoolwork, was helping the nurses. One project was collecting all the old ladies' false teeth and cleaning them.

Doctors ordered her to avoid physical exertion. But as a teenager she turned defiant: she began to dance. Her mother urged her to learn a trade she could count on, like being a secretary. Alma set her jaw. An eighth-grade classmate told her about a school for the performing arts, which sounded to her like the "High School of the Reforming Arts." She wanted to study ballet there.

She prepared for the audition by watching dancers on the *Ed Sullivan* television show. She wore gold-painted slippers and a leotard. Confidently, she handed the judges a recording of *The Nutcracker Suite*. As the music welled up, she began leaping around the room, smiling radiantly. She began as one of only three black freshmen in the dance department. By midyear she had worked her way into her class's top third. Because she was black, teachers discouraged her from ballet, steering her into modern dance.

After Alma graduated in 1963, she studied under a scholarship at the Martha Graham school. She toured with a children's theater troupe, danced in England, then returned to dance with an all-black group, the Tally Beatty Dance Company. She married. She joined the Alvin Ailey dance company, danced in Broadway's *The Wiz* and in the movie version. But her husband died, leaving Alma with a small daughter and son. Rethinking her life, she resolved "to be of use."

She earned a bachelor's degree in psychology. And she married a social worker who had decided he could earn more as an electrician. They studied a map and moved to Vermont. In 1987 Alma graduated from the University of Vermont with a second bachelor's degree, this time in nursing.

4 P.M.—Today is the 23rd anniversary of her first husband's death, Alma thinks. Her daughter is working on a master's degree in social work at Boston College. Her son, who graduated from MIT, is working on a doctorate at the Harvard School of Public Health. But she cannot reminisce. She has too many patients. "I'm Alma," she says, her calm voice soothing. "I'll be your nurse this evening."

He has pneumonia, this 88-year-old farmer, with big bones and a massive jaw. His roomful of relatives, large older women, exude rosy-cheeked cheer. But he wheezes and hacks. "All righty, I'm going to check you out!" Alma says, applying a blood pressure cuff. "How are you feeling today?"

"Been down to get my head x-rayed," he gasps. "They told me," Alma says, "they didn't find anything in there—I mean, anything that's not *supposed* to be in there." She laughs, easing a thermometer into his mouth. "I told them all they'd find in there is horse manure," he retorts.

She puts her stethoscope to the man's back and listens to his lungs, frowning. She takes his pulse, tapping the data into the room's computer.

Two patients occupy the next room. She leans over the bed of an ancient woman, gaunt, hardly breathing. The woman is anemic; she has been brought in from a nearby nursing home for a blood transfusion. Afterward, she will return to the nursing home. "Do you remember me from last time?" Alma asks, leaning over the woman's bed. She brushes the woman's forehead with affectionate fingers. "My hands are cold," the woman says. Alma rubs them gently. "Your blood will be up soon," she says.

In the next bed is the young mother with rhabdomyosarcoma, on the telephone with her fifth-grade twins. "I'm talking to Alma," the patient tells her daughter. "No, she's not a doctor, honey. She's a nurse. Yeah, I know. She's really cool."

Next, Alma visits the mystery patient, an emaciated 56-year-old with twig-like arms and a wild shock of gray hair. He was admitted through the Emergency Room, with half a tongue and an esophageal obstruction. He is ranting. " . . . and they don't give me nothing to eat here, either!" he is saying, although a dinner tray is sitting untouched beside his bed. "And I do want codeine, to take the damned sharp edge off this pain in my throat," he says.

In the hall, Alma tells a passing dietary technician to get the patient cream of mushroom soup. "He wants

Dr. John Valentine, an oncologist who left the city to practice in Vermont, shoulders a painful but necessary task—telling one of his patients that a previously treated cancer has recurred.

Valentine reviews a series of CAT scans and discusses the options with a staff radiologist. Making a diagnosis and formulating a treatment plan offer the kinds of challenges that he thrives on.

some choice, to have that much control," she says. She is at the medicine cart, checking the MAR, when she sees the mystery patient has lit his call light. She rushes down. "Where's my soup?" he demands.

Alma, however, is looking at the tissues heaped in his wastebasket. "Where's this blood coming from?" she says. "From my nose," he snaps. Abruptly, with a petulant flick of his hand, he knocks over his wastebasket, strewing the contents. Alma rights the basket and refills it. She puts a wet washcloth to his nose. "I want you to use a tissue," he says. "That would be too rough," Alma says calmly. "Now I'll be right back, and let me find out where she went with your food."

Now the woman with rhabdomyosarcoma has lit her light, worried that her two chemotherapy bags are not pumping out equally. Using her wristwatch, Alma times them. She explains that one bag is puffed up with a little more air, making it seem fuller.

The spina bifida patient's back is hurting. She helps him adjust his position, and gives him his iron pill. Finally she hurries downstairs to the cafeteria for a quick supper.

Her leukemia patient's temperature is 103. Alma soaks washcloths and places them on the woman's forehead.

6:30 P.M.—Alma visits the woman with leukemia. She knows Dr. Valentine brought her biopsy results because nurses waylaid him, eager to hear if the patient was in remission.

"I've brought you a present," Alma says. It is a scarf, purple like her own, fringed. It matches the woman's bathrobe. It will hide her baldness. As usual, the patient's husband is spending the evening. Alma knows they are both frightened. "Everything will change now," Alma tells them, her voice quiet, calming, as she takes the patient's temperature. "How you see yourself will change, and your relationship will change."

Sickle-cell has taught her that. But she also has become diabetic. In 1988, she developed an autoimmune lung disease, pulmonary sarcoidosis. And in 1992 she abruptly collapsed with thrombic thrombocytopenia purpura, a condition in which the blood's platelets cohere, causing her kidneys to fail and her breathing to stop. She spent three weeks in a coma in intensive care, then three weeks recuperating in the medical-surgical ward, and an additional three weeks in the rehabilitation unit.

On one of Alma's sickle-cell hospitalizations, not long after she became a nurse, to save her coworkers from seeing her in so much pain, she struggled to the bathroom on her own, clinging to her rolling IV pole. Back in bed, she thought, "My God, how many of our patients do this?" It reinforced her determination to answer patients' call lights promptly.

Her leukemia patient's temperature is 103 degrees. She soaks washcloths in cold water in the bathroom sink, then drapes them carefully across the woman's forehead and under her arms. "Thank you, Alma, thank you so much," the woman says. "I'll be back, dear," Alma says.

7:15 P.M.—Alma, helped by a student nurse, is working on the young man with spina bifida. Both women wear yellow protective robes as they prepare to clean his open wounds. A stench emanates from his fistulas, wounds that erupted from inside his body. Alma gently washes his back while he talks about his model car kits, piled on his chairs. One new wound is so deep that Alma can see down to the leg muscle.

9 P.M.—A stretcher crew is wheeling out the aged lady who received a blood transfusion for anemia, returning her to the nursing home. Alma stops them to lean over the stretcher and whisper in the patient's ear. She kisses the woman's forehead.

10:30 P.M.—Alma, almost running from room to room, is tapping data into the rhabdomyosarcoma patient's computer. The woman is saying that two weeks before she was diagnosed with cancer, she quit her job cleaning

Looking in on a patient, Alma Mueller tenderly strokes the brow of her sleeping charge. The young woman, undergoing chemotherapy, has been stricken with a rare cancer.

motel rooms. Meanwhile, her husband had just taken a new job, painting highway white lines. It was a pay raise, but they make under $20,000 a year. They had decided to forgo health insurance. "I don't know what we're going to do about the medical bills," the woman shrugs, sitting up in bed. "It was $30,000 just for last month. I suppose we could give them all a nickel a week each."

10:45 P.M.—Alma is tending a new patient, a retarded man, when she hears the night nurses arriving. Her shift is almost finished. She has time for one last round.

The man with half a tongue seems to be asleep, although he's muttering. The woman with rhabdomyosarcoma is asleep. So is the spina bifida patient, his wounds newly bandaged. The 88-year-old farmer with pneumonia is gasping in his sleep. And the woman with leukemia lies still, her eyes closed. Her husband has gone home for the night.

Alma has no time to tape her observations. She hurries to Report, to brief the incoming night nurses in person. And now she has data entry to attend to, a chore she could not fit into her shift. It will be hours before she can actually leave.

Lying in the dark, the woman with leukemia is not asleep. She is thinking about the cancer in her blood, remembering the day. Her thoughts shift to Debby Farnham, warning the doctor she was overdosing on antidiarrheal medication. She thinks: "Debby saved me from major complications."

And she thinks of Alma's soothing hands, draping her in chilled washcloths, bringing down the fever that engulfed her.

Dr. Valentine brought her the biopsy results today: she is in remission. When he looked through his microscope, he saw no signs of leukemia. She has more chemotherapy regimens to go. "At least I have a chance," she thinks. "I have a fighting chance."

She hears the night nurse walk quietly into the room and look down at her in the dim light. But the patient, too weary now to open her eyes, is almost asleep. She feels the nurse kiss her on the forehead. "Good night," she hears the nurse say. "Good night, Sleeping Beauty."

1 A.M.—Alma has finally finished typing data into the computer. Her day has ended. Alma Mueller is leaving the hospital.

Joyce and Richard Wolkomir have lived this story: 19 months after being diagnosed with leukemia, Joyce remains in remission. Award-winning photographer Lynn Johnson is based in Pittsburgh.

EGO
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THE CASE OF THE DISAPPEARING FRESCOES

BY STANLEY MEISLER

Or how a mustachioed Barcelona artist foiled an elaborate plot to spirit Catalonia's priceless Romanesque paintings away from their homeland

IN THE SUMMER OF 1919, JOAN VALLHONrat, an old friend of Pablo Picasso's, made his second arduous trip from Barcelona to the village of Mur in mountainous western Catalonia, just below the Spanish Pyrenees. Mur was so isolated that the 45-year-old Vallhonrat had to travel by train, stagecoach and mule to get there. A thin, dapper man (judging by Picasso's sketches of him) with a flowing, upturned mustache, a Vandyke beard and smiling eyes, Vallhonrat was a well-known illustrator of posters. Like most Barcelona intellectuals, he was a fervent Catalan nationalist, and he had accepted a commission from the Institute of Catalan Studies to travel to the remote Romanesque churches of Catalonia and paint scaled-down reproductions of the frescoes that had adorned their walls for centuries.

When he entered the church of Santa Maria de Mur, however, he could not paint his reproductions. He found a strange group—an American of Polish birth, a Frenchman and three Italian craftsmen—gingerly chipping away the plaster behind the frescoes to tear them down and cart them away. This cabal, financed by a rich Barcelona industrialist and art collector, had purchased some of the best-known Catalan frescoes of the Romanesque period (from the mid-1000s to the early 1200s) from local bishops, priests and mayors. Their aim: to sell, for princely sums, most of the artworks to museums and rich collectors in the United States.

Vallhonrat rushed back to Barcelona and raised the alarm. He was too late to prevent the sale of the main fresco of Santa Maria de Mur to the Museum of Fine Arts in Boston (where the work is still displayed). But his alarm galvanized angry Catalan politicians and intellectuals into a campaign that stopped the export of the others. The Catalan nationalists had headed off an art scandal of immense proportions. If the international gang had succeeded in shipping the frescoes to the United States, it would have been a caper on the scale of the Elgin marbles coup.

Yet there were no legal restraints on shipping the frescoes from Spain to the

Christ in Majesty (left), from the apse of Sant Climent de Taull, is now on display in Barcelona, along with frescoes removed from eight other churches (above) after the scandal was quashed in the 1920s.

Trade-off: visitors to Sant Climent de Taull (right) now see a painted replica of Christ in Majesty in the apse (left); the original is safe in the National Museum of Catalan Art.

United States in 1919. Spain had no laws prohibiting their export. Under a concordat signed in 1851 between the Vatican and the Spanish government, Roman Catholic authorities could dispose of church property in Spain any way they wished.

"There wasn't a sense internationally then that works of art should not leave their country," George Shackelford, the curator of European paintings at the Museum of Fine Arts in Boston, explained in a recent interview. If there had been, the United States could never have developed its great museums of art, which now rival the museums of Europe. A case can be made, in fact, that most of the Catalan frescoes would have deteriorated if the foreigners had not started to remove them. And the National Museum of Catalan Art on Montjuic hill in Barcelona could not display, as it does now, a wondrous array of Romanesque frescoes unequaled by any other collection on earth.

To understand the importance of the Romanesque frescoes to Catalan nationalists, an outsider must know a little about the history of Catalonia, a land of extraordinary beauty, with the jagged Pyrenees inland and a host of lovely inlets and tranquil beaches on its Mediterranean coast. Now an autonomous region of more than six million people in northeastern Spain, Catalonia was an independent principality in medieval times, its traders and sea captains calling at ports as far east as Egypt and Constantinople, its diplomats maintaining consulates in dozens of cities.

The Catalans lost their independence in the 15th century, but Spain has never managed to assimilate them fully. The Catalans have retained their own language and folkways. Even the dictator Francisco Franco, who despised regional loyalties, failed during his tyrannical rule from the 1930s to the 1970s to wipe out Catalan nationalism.

The Romanesque period gets its name from the attempt by medieval architects to imitate structures of the Romans. For Catalans, the era has special meaning: Catalonia emerged as an independent power during those years. It was natural that Catalans, inspired by the resurgence of nationalist feeling that came out of the 19th-century Romantic movement in Europe, would begin almost a hundred years ago to study

MICHELE CUREL (2); P. 52 MUSEU NACIONAL D'ART DE CATALUNYA; P. 53

and preserve their more than 2,300 Romanesque cathedrals, monasteries, convents and churches.

Some of the churches can still be reached only by crossing breathtaking mountain passes that close with winter snowfall. Most are small, thick-walled, dark and cold; today, few are still used for worship.

Take the Church of Sant Miquel (Saint Michael) in La Seu d'Urgell. Its frescoes were removed and are now displayed prominently in the National Museum of Catalan Art in Barcelona. Built in the early 11th century, Sant Miquel is the perfect model of a Catalan church of those years—shaped like a cross with the head facing east. A central apse hugged by a lesser apse on each side makes up the east wall. From the outside, the apses transform the wall into rounded bulges in aged, brown stone. A slim belfry stands tall and breaks the pattern of curves. Today, the town of La Seu d'Urgell uses the church as an exhibition space; when I visited last year, its quiet interior was crowded with a hodgepodge of placards recounting the life and influence of Sant Jordi (Saint George), patron saint of Catalonia. It was difficult to sense the mood of the church and to imagine what it would have looked like with the frescoes still on its walls.

The Church of Santa Maria in the town of Tarrasa, near Barcelona, is one of the few in Catalonia that still has its frescoes. They were discovered just a couple of years before the conspirators started pulling down the frescoes from Santa Maria de Mur. Josep Puig i Cadafalch, the renowned Barcelona architect and Catalan nationalist leader, led the excavations at the Tarrasa church and insisted that the paintings remain on the walls. The main fresco in the apse of the south transept commemorates the murder of Thomas à Becket in Canterbury Cathedral in 1170 and was probably painted before the turn of the 13th century.

The Tarrasa frescoes are far from the most beautiful in Catalonia. Their majestic Christ is pallid; the murder of Thomas à Becket is acted out in scenes that seem to come from a comic strip or a child's doodle book. But a visitor, standing in front of the frescoes in the apse of the dark, dank church, built of thick, powdery walls, is always conscious of how old they are.

It was relatively easy in the early 1900s to preserve the paintings of Tarrasa because the town, only 20 miles from Barcelona, was under the watchful eyes of Catalan nationalists and intellectuals there. But the Barcelona establishment was not even sure at the turn of the century what the isolated churches of the inland Pyrenees contained. That is why the Institute of Catalan Studies began to send Joan Vallhonrat and other artists to the Pyrenees in 1907 to paint reproductions of the frescoes.

The institute's work attracted the attention of Lluis Plandiura, a young, wealthy Barcelona sugar manufacturer and art collector who became the éminence grise behind the gang of fresco removers discovered by Vallhonrat in Mur. Plandiura is an unlikely villain in any discussion about art in Barcelona. He is, in fact, best known for his early purchases of works by Picasso, which today make up a critical part of the Picasso Museum in Barcelona.

A group photograph of Picasso with artists, collectors and friends, taken at a gallery in Barcelona in 1917, reveals Plandiura as a handsome, self-confident young man of 35. He wears a bow tie, looks a trifle overweight and displays the slightest trace of a smile. An avid collector of medieval art as well as early Picassos, Plandiura resented the competition from buyers for the Barcelona museum and tried for years to outbid them at every juncture. This rivalry would persist until the worldwide economic depression of the 1930s. Then with his business in trouble, Plandiura sold his holdings of Picassos, and of Romanesque and Gothic art, to the city of Barcelona for seven million pesetas, an enormous sum in those days.

Reinforced with sizing and muslin, the frescoes were unrolled from the walls.

In 1919, Plandiura wanted for his own collection some of the frescoes that his team was removing, but intended to sell the majority abroad. To avoid stirring up local feelings against losing the works, his agents told local priests and mayors that the paintings were destined only for Barcelona. Plandiura also knew that American museums and collectors, with their paucity of Romanesque art, would not concern themselves with how and why the works had left their homeland.

Little is known about two key members of Plandiura's team—Polish-born Ignasi Pollak and Gabriel Dereppe, a Frenchman who may have lived in the United States. They have been described by the late Joan Ainaud de Lasarte, director-general of the art museums of Barcelona from 1945 to 1985, as "two singular persons with the spirit of adventurers." The three other collaborators were Italian craftsmen who had mastered the intricate technique of taking frescoes down from walls.

The exact relationship between Plandiura and the duo of Pollak and Dereppe is not clear. In letters to the Museum of Fine Arts in Boston, Dereppe, claiming that he and Pollak had "originated the plan for preserving this art," dismissed Plandiura as a "temporary financial associate." When the plot to sell the frescoes was uncovered, Pollak, not Plandiura, acted as the front man dealing with angry museum officials in Barcelona. But the Boston museum paid Plandiura, not the others, for the fresco of Santa Maria de Mur. Catalan art historians now insist that Plandiura organized and led the enterprise.

The alarm raised by Vallhonrat against the conspiracy was swiftly picked up by Joaquim Folch i Torres, the 33-year-old director of medieval art for the Barcelona Museum of Art. Folch's tenacity would help create the National Museum of Catalan Art.

Folch plied Barcelona newspapers with the story, persuaded the president of the weak autonomous government to support him, and tried to pressure Catholic bishops to break their contracts with Pollak and his team. Catalan nationalists were incensed by what they regarded as a rape of patrimony. Confronting Pollak at a private meeting, Folch, according to the official records of the board of museums, warned him, "We are ready to use all legal means to prevent these frescoes from leaving for foreign lands." This was a bluff since it was not illegal to export the frescoes.

Pollak (and, of course, Plandiura) probably knew this was a bluff but thought it unwise to defy the public outcry against the project. "Despite what people claim I said," Pollak told Folch, "the Mur frescoes are not going overseas. But I can't offer them to your museum, because I've already sold them to a Barcelona collector." This was pure deception. The collector was, of course, Plandiura, and the main Mur fresco would head overseas to Boston two years later. But Pollak told Folch he was ready to deliver the rest of the frescoes (all still in place) to the Barcelona board of museums.

Folch persuaded the board to purchase the rest. Many board members wanted to allow their new property to remain on church walls. But a team of experts surveyed the churches and concluded that the paintings would disintegrate or suffer damage from vandals if left there. The board signed an agreement with Pollak in early 1920 that authorized him to remove the frescoes and deliver them to Barcelona. With grants from the Catalan government and the city of Barcelona, and a loan from a local bank, the museum board paid Pollak 675,000 pesetas for his team's labor in the delicate and difficult task of pulling them off the walls and reinstalling the murals in Barcelona.

It took more than four years to complete the painstaking work. Under an ingenious process developed in their homeland, the Italian craftsmen, having painted a gluey sizing on the face of the fresco to stabilize it, would apply layers of cotton muslin to it, smoothing the muslin down with a paste that hardened and crusted. The Italians then carefully chiseled a thin layer of the plaster behind the painting so that it separated from the wall. The hardened muslin kept the face of the fresco in place. The Italians removed the frescoes in sections, rolled them up, and shipped them to Barcelona.

As a result of this slow and expensive labor, the board of museums acquired the frescoes from nine Romanesque churches in Catalonia; they now form the nucleus of the medieval collections of the National Museum of Catalan Art. These include the extraordinary frescoes from the churches in Taull and La Seu d'Urgell. In one case, the board accepted a substitute for a fresco specified in the contract when it was told that the original had already been sold to a Barcelona designer. The designer turned out

The fresco from the chapel apse of Santa Maria de Mur (left) was sold to the Museum of Fine Arts in Boston.

INSTITUT AMATLLER D'ART HISPANIC; P. 56 MUSEUM OF FINE ARTS, BOSTON

to be a front man for Plandiura. Plandiura, meanwhile, somehow put his hands on frescoes from five other Romanesque churches as well—including the best work of a highly praised artist known only as the Master of Pedret.

In the early 1930s, the frescoes were moved into the National Palace, an enormous domed building of eclectic styles and churrigueresque towers constructed on Montjuic hill for the International Exposition of 1929. This evolved into the National Museum of Catalan Art, with its unparalleled collection of Romanesque art and lesser, though still formidable, collection of Gothic art. With the addition of the Plandiura collection, and more frescoes removed from churches because of their deterioration, the museum—recently remodeled by Italian architect Gae Aulenti, who designed the interiors of the Musée d'Orsay in Paris (SMITHSONIAN, March 1987)—now has frescoes from more than 20 Catalan Romanesque churches.

Joan Vallhonrat (here, in a Picasso portrait) came upon the gang in an isolated church.

The curators know that their museum would not exist if a mass exodus had not been halted many years ago. "This is not like other museums," Eduard Carbonell, the director-general of the museum, told me recently. "Other museums like the Prado in Madrid began with the legacy of kings. This museum began with the recuperation of the patrimony of our country."

In an effort to simulate the original experience of seeing the frescoes, the museum has fashioned several rooms with apses that suggest the churches from which the paintings came. But it is hard to imagine that you are sitting in a cold, dark, somber church when you contemplate the magnificence and power of the museum's paintings. That is certainly true of the effect of the finest known work of Catalan Romanesque art—the fresco from the main apse of the Church of Sant Climent (Saint Clement) in the village of Taull. Picasso kept a poster of this fresco in his home in Mougins in the south of France.

The artist in Taull painted the apse around the time the Sant Climent church was consecrated in 1123. Like the other anonymous itinerant artists who painted the walls of Romanesque churches, he followed a set of conventions. The most important of these decreed that a majestic Christ painted as ruler of the universe should dominate the apse. He should be seated on a throne or a rainbow-like band within an almond-shaped frame, known as a mandorla. This artist's intensely colored Christ exudes both power and delicacy, the power coming from an imperious presence and an extraordinarily fixed stare, with the delicacy reflected in wonderfully long and tapering fingers and exquisite raiment. The folds of the Christ's garment reveal a bodily fullness and roundness that anticipates the Renaissance, marking the portrait as art of great sophistication.

Another itinerant artist working in Taull at the same time, at the nearby Church of Santa Maria, followed the second most popular convention—a portrait of the Virgin Mary and the Christ Child sitting on a throne within a mandorla. Although they have charm, neither the mother nor the child in the Taull painting resembles the warm and beautiful full-bodied Madonnas and Christs that would enrich the Italian Renaissance 300 years later. The Santa Maria de Taull Christ Child, in fact, is really an undersized man, looking silent and ill at ease. The three kings approach with puzzlement and no joy.

The Barcelona museum can be overwhelming. More Romanesque frescoes will be seen there in an hour or two than most people will see elsewhere in a lifetime. It is easy to feel engulfed in a sea of simple beauty and stark piety. A visitor should focus on special samples: the graceful, supplicating Elijah and the intense Virgin Mary with fiery grail, for example, from the fresco that Plandiura secretly bought from the monastery chapel of Sant Pere (Saint Peter) in the town of Burgal; the emaciated David slaying Goliath from the Church of Santa Maria de Taull; and the bearded, stern and elegant Saint Peter from the Church of Sant Miquel in La Seu d'Urgell. The museum also exhibits some minor fragments from the Church of Santa Maria de Mur along with a small photograph of the main fresco, now in Boston.

That fresco is still the best example of Catalan Romanesque art in the United States. Another smaller Catalan fresco from the Church of Sant Joan (Saint John) in the town of Trédos is exhibited in the Cloisters of the Metropolitan Museum of Art in New York. This fine depiction of the Virgin and Child accompanied by archangels and Magi was purchased by the Met in 1950. Although the fresco in Boston, which features a majestic Christ with an air of awkward innocence and simplicity, lacks the power of the great fresco of Sant Climent de Taull, it is almost intact, preserving more of the original than all the other well-known Romanesque frescoes of Catalonia.

The Boston museum paid Plandiura $80,000 for the fresco in 1921. In the museum's bulletin of June 1923, assistant

The three frescoes above—showing David and Goliath, the Virgin with Saints John and Paul, and the Virgin Enthroned—were removed from their churches and taken to Barcelona. Among the few frescoes still in situ is the apse fresco in Santa Maria de Tarrasa (left) depicting the martyrdom of Thomas à Becket.

This fresco with Virgin and Child, removed from the Church of Sant Joan de Trédos, is now at the Cloisters in New York.

director Charles Henry Hawes offered a rather disingenuous explanation of how the painting became available. "The Barcelona Museum, in its desire to preserve the frescoes of these churches," he wrote, "obtained authority to remove them, and a wealthy collector who had aided in the operation secured the best preserved example. Ultimately he decided to send this to America, where it has reached its final resting-place in Boston."

Hawes was probably repeating the story concocted by Plandiura and his agents, but he undoubtedly suspected that the circumstances were more complicated than that. When he and the museum's "Keeper of Paintings" were shown the painting by Dereppe at the Hotel Savoy in New York, the museum's notes on the meeting reveal that they were told "the extraction of this fresco occasioned some outcry in Spain and it seems improbable that another like opportunity will ever occur again."

After buying the fresco, the museum sent architect Georges Gromort to Mur to measure the apse, so that the original manner of displaying the work could be duplicated in Boston. But Gromort wrote back that he could not do the job well because he had to conceal what he was up to. After the fresco was removed, he reported, the townspeople had become upset by a rumor that it was headed for a foreign country. "This agitation was only calmed," Gromort went on, "by flatly denying the rumor, and by allowing it to be believed that the fresco, far from being destined to leave Spain, had been taken down under the care of the Barcelona Museum where it was to be exhibited." His account left no doubt that the sale of the fresco to Boston would be regarded as a scandal in Catalonia.

Catalan nationalists at first blamed Americans for the loss of the fresco of Santa Maria de Mur and for the attempt at mass export that almost deprived Catalonia of its best Romanesque frescoes. Writing in a Barcelona magazine in 1924, Joaquim Folch i Torres, the museum director who took up the alarm from Joan Vallhonrat and saved almost all the frescoes, put the blame squarely on "some American antique dealers, who . . . came to Catalonia and tried to pull down these marvelous works, pride of our nation, to bring them to their country." He evidently regarded both Pollak and Dereppe as Americans.

Since then Plandiura's role in the affair has become much clearer. Catalans no longer blame Americans for what happened. Nor is there any outcry in Catalonia for the return of the fresco. The incident, which once aroused so much passion in Catalonia, is closed. Catalonia, after all, still has incredible holdings of Romanesque art, a treasure that—ironically—might not be so accessible to both Catalans and visitors if the conspirators hadn't tried to whisk much of it away to America.

Stanley Meisler, a former Los Angeles Times *correspondent in Spain, has written on the Prado, the Alhambra and Joan Miró.*

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Setting out from Canada for Virginia, a sandhill crane covers the first leg of a 500-mile journey.

Fly AWAY HOME

WINGING SOUTH, OPERATION MIGRATION EMBARKS ON A REMARKABLE ODYSSEY

THE PALE WING OF THE FRAGILE PLANE, A COSMOS Phase II ultralight, dips out of sight over the brow of the hill. Pilot Joe Duff is down, his yellow aircraft crumpled like a napkin on top of him. As the reporter covering Duff, I stand for a moment in a southern Ontario pasture, paralyzed, unbelieving.

An hour later, Duff, a deep gash in his forehead, his shoulder trussed in white, is confined to his bed in the emergency room at Port Perry Municipal Hospital. With characteristic Canadian politeness, Duff is asking the nurses how they are today. The nurses, equally low-key, appear not to notice that I, the visitor, am outfitted in a surreal getup. I am wearing a gray poncho and a headdress consisting of a red baseball cap and a gauzy face veil, intended to mimic the appearance of a sandhill crane.

It is August 1997. I have signed on for some weeks with Operation Migration (OM), an extraordinary nonprofit wildlife organization cofounded by Bill Lishman and Joe Duff. These two pioneers in bird migration are imprinting a flock of sandhill cranes (as stand-ins for endangered whooping cranes) to fol-

BY ADELE CONOVER
PHOTOGRAPHS BY JOSEPH DUFF

Cranes soar near an Operation Migration ultralight. Methods for teaching birds to migrate alongside planes were pioneered by OM cofounder Bill Lishman (right).

low their ultralight aircraft. I am eager to help out in any way I can—which is how I, an apprentice bird imprinter, came to be standing, panic-stricken, in a pasture as Duff crashed.

At that moment, though, before I could tear off for the ER, I had a critically important job to do: marshal a flock of sandhill cranes safely back to their holding pen. Duff had been working with the cranes—laboriously familiarizing them with his craft, teaching them to follow his lead into the air—when he went down. Crane 201, it would turn out, had been the cause of all the trouble. Once aloft, the young male had followed Duff too closely. One of his long gangly legs had caught in the web of the ultralight's rigging. To set him free, and save the bird's life, Duff had stalled the plane in midair but entangled his craft in a tree, and lurched down with a sickening thud.

The 16 fledglings, disoriented and distressed, began to fan out over the field. As another member of the OM crew raced Duff (who miraculously walked away from the wreckage) to the hospital, I had to coax these frightened birds back before they scattered. I trotted around the pasture for more than an hour, shepherding the cranes into their pens. Then, breathing a big sigh of relief, I set off after Duff for the hospital.

I knew, from the moment I met up with Lishman, and Duff and his crew, that I was part of a truly groundbreaking expedition. For the first time, sandhill cranes would migrate, led by OM pilots, to a destination until now unpopulated by cranes. The birds would fly more than 500 miles from southern Ontario, which lost its cranes nearly 100 years ago, to Airlie Center, a wetland compound in Virginia, also a destination devoid of cranes. In the spring, or so Lishman and Duff hope, the flock of big gray birds should make it back "home," winging on their own from Virginia to Ontario. This is a daunting task indeed: Lishman and Duff believe the cranes must be taught to avoid humans and focus on learning migratory behavior. Hence the adoption of the bizarre, but essential, "crane suits."

This sandhill odyssey represents a remarkable achievement in behavioral ornithology. Eventually, Lishman and Duff plan to lead a flock or two of wild whooping cranes from Manitoba to the Southeastern United States—teaching them, too, to migrate. Today, only one wild flock travels yearly between Canada and Texas.

Cranes, like other large waterbirds such as geese and ducks, lack the so-called homing instinct so prevalent in migratory songbirds. They must learn to migrate from their parents. In the Western United States, sandhills have already proved their mettle on human-led migrations. Researcher-pilot Kent Clegg has led sandhills 800 miles from his Idaho ranch to Bosque del Apache, New Mexico, for the past three years. (In 1977 he included several whooping cranes in his migration.) And in 1995 and 1996, famed bird behaviorist David Ellis trained the obliging sandhills on a truck-led migration from Flagstaff, Arizona, to Buenos Aires National Wildlife Refuge, in Arizona on the Mexican border. But because Clegg's destination was already inhabited by migrating cranes, it was possible that his sandhills could have taken their

Duff stalled the plane in midair, entangled his craft in a tree, and lurched down with a sickening thud.

cues from other wild cranes when the young birds returned to their fledging grounds in the spring.

It has long been the dream of the Whooping Crane Recovery Team (a group of ornithologists from the United States and Canada) to establish a second flock of whooping cranes, isolated in habitat and migration route from the remaining migrating wild flock. That existing flock winters in the Aransas Wildlife Refuge in Texas and migrates to Wood Buffalo National Park in Canada. The wild flock, estimated at 180 birds, is up from a scant 16 in 1942, thanks to efforts by U.S. and Canadian biologists and crane lovers during the past half-century. But a toxic spill on that flock's wintering grounds, situated close to Gulf Coast shipping lanes, an avian disease or a major storm could cut down the wild whoopers forever.

In 1993, crane biologists began to take note of Lishman and Duff's success with imprinting Canada geese for migration. In 1993 and 1994, the pair made migration history when they taught two different flocks of Canada geese to migrate from Canada to Virginia and South Carolina. Both flocks made the return migration on their own. (Their work inspired the Academy Award-nominated film *Fly Away Home*, the tale of an estranged father and daughter who teach a flock of Canada geese to migrate. The story is a fictionalized version of Lishman's life.)

Lishman is an old hand at imprinting birds, the technique developed by Austrian ethologist Konrad Lorenz in the 1930s. (Lorenz taught greylag geese to bond with him as their "parent" and follow his lead.) Lishman grew up on a farm in Ontario in the 1940s. A love of wild birds and the techniques of flight came naturally; his mother was a biologist, and a cousin who had been a World War II fighter pilot taught him to fly. At age 17, Lishman tried to join the Royal Canadian Air Force, only to fail the physical because he is color-blind. He returned to Ontario and eventually became a successful metal sculptor. His pieces are in private and public collections throughout North America.

But he never lost his love of birds and flying. In 1985 Lishman learned from naturalist William Carrick how to imprint goslings to follow a boat. Lishman graduated eventually to trying to teach birds to fly alongside a hang glider. Finally, he conditioned geese to follow his ultralight. Ultralights evolved from hang gliders. OM's ultralights are tiny 300-pound planes sporting a tricycle body, hence the nickname "trike." They are powered by a rear propeller and have hang-glider-like wings.

Duff, too, was raised in the outback of Ontario and had an affinity for both birds and flying, a skill he learned from his firefighter-pilot brother. After stints as a silver miner in the Yukon, a forester and, for 25 years, a prize-winning commercial photographer, in 1993 he joined up with Lishman in the Operation Migration enterprise.

OM '97's sandhill eggs were collected from the breeding sandhill stock at the Patuxent Wildlife Research Center in Laurel, Maryland. During the last 24 hours of their 30-day incubation, the eggs "listened" to tapes of OM '97's ultralight engine and the "crane" voices of Duff and Lishman imitating the "Brrrrrrp" parent call. Two groups of sandhills are destined for the pioneering migration: a group of eight "older" birds (Cranes 201-208) and an equal number of "younger" birds (Cranes 209-216). The groups hatched approximately 20-30 days apart.

Very young cranes give sibling rivalry new meaning—a dominant crane of the usual clutch of two can peck the other to death. So at Patuxent, the young cranes were penned individually. In the wild, often the parents solve this problem by each taking one until the cranes are older.

The colts, as the young cranes are called, take a long time to grow up, and it's three to five years before they breed. They have to learn from their parents what to eat. At Patuxent, crane wranglers Jane Nicolich, Brian Clauss and Dan Sprague, periodically joined by Lishman and Duff—all in full crane costume—brandished taxidermied crane heads to point out mealworms and other tasty victuals. Feeding a growing crane can be labor-intensive: a 2-month-old captive can down 200 grasshoppers in an hour, so the colts also got "crane chow"—supplements of grain and corn, which they also eat in the wild.

To accustom the colts to the ultralight as "parent," the crane wranglers first trundled them under the wings of a goose "toddler"—a contraption devised by Lishman—all the while playing the ultralight engine recording that the cranes had heard as embryos in the eggs. The toddler looks like a large model plane, and it is worn like a tutu by the crane-costumed human parent. Within a few weeks—the fast-growing cranes, by then 2½ feet tall, graduated to strolling beneath the wings of the taxiing ultralight.

Migrating cranes regard the place where they learned to fly as home ground, or final spring destination. So by late July, OM '97 had to get the colts to their fledging ground in Canada. In the name of crane conservation, pilots from the Canadian Armed Forces agreed to help out. The CAF flew the caged cranes from Andrews Air Force Base, near Washington, D.C., to Ontario.

The fledging ground is in southern Ontario's glacier-sculpted farmland near Lake Scugog, a couple of hours northeast of Toronto. The birds, divided by age to minimize bullying, live in large pens next to a pasture-cum-ultralight-runway owned by farmer Nelson Reader. The site, which abuts a 17,000-acre wetland, sits next to Lishman's 100-acre compound, Purple Hill. (It is here that Lishman and Duff trained the geese who became the subjects of *Fly Away Home*.)

OM '97, by this time, has acquired another bird-fancying pilot, DeWitt "Deke" Clark, who has just completed a 30-year career as a United Airlines pilot. Clark is adjusting to the differences between flying a 300-pound ultralight and a multiton 777.

Now, in mid-August, some of the older birds are getting the hang of flying in the vicinity of the ultralights. A typical training session begins with a costumed crane wrangler leading the birds from their pen and out into the pasture. A pilot cues up with the ultralight motor, and purrs "Brrrrrrp" while slowly taxiing down the field, dropping a trail of mealworms as a further inducement.

The crane wrangler jumps into action, flapping his arms, trotting and ululating the "Brrrrrrp" call behind the plane. If and when the flock gets airborne, the wrangler hides, either in the pen or in a waiting pickup truck. (If the cranes see the wrangler, they might land, choosing to follow the ersatz bird.)

When everything works, the cranes bound into the air in a feathery flurry and head in the direction of the ultralight. When it doesn't, the recalcitrant flock is forced to fly—scared aloft by the Terrible Pickup Truck, driven by the crane wrangler who, having removed the crane suit, has reverted to a nasty, yelling human. The truck barrels down the pasture runway, honking and blinking its lights.

Feeding a growing crane can be labor-intensive: a 2-month-old can down 200 grasshoppers an hour. So the birds get grains, too.

Uniting the older and younger colts in one flock seems almost impossible from the outset. Through September,

Teaching a bird to migrate, led by aircraft, is daunting from the start. To avoid identification with humans, crane-costumed handlers wield crane hand puppets to teach feeding (left). Later, trainers in crane gear (top, right) introduce birds to synchronized flying. One instructional device is a plane mock-up (bottom, right), or "toddler," worn by a human in a crane suit.

prospects for crossing Lake Ontario appear dim. Lishman notes, "We don't know if they'll ever be able to fly together for two hours straight,"—which is what it will take to fly over the lake. (In 1995, apart from making history by flying the first ultralight-led migration, Duff and Lishman were the first ultralight pilots to cross Lake Ontario.)

But by the last week in October, the entourage is deemed ready to go. OM '97 includes 14 cranes and three ultralights—two planes piloted by Duff and Lishman will alternate between leading and chasing; the third, piloted by Clark, will serve as top cover, flying above the flock. The expedition also includes a ground crew, a motor home, three trucks, a pop-up trailer, two motorcycles, a crane trailer and an equipment trailer. Pilots Paula and Don Lounsbury in their Bellanca Scout airplane will fly a day ahead, looking for landing spots along a route that leads east around Lake Ontario—it being too late in the year for a safety boat to cross with the team. The contingent will travel southwest down through New York, Pennsylvania, Maryland, West Virginia and finally Virginia.

At daybreak on October 24, crane wranglers Sprague, Clauss, and Lishman's oldest son, Aaron, in civilian life a musician and computer ace, set the birds free. The cranes, showing off their five-foot wingspan, dance out, ready to go. A gaggle of crane-costumed press screen themselves behind a thin line of trees, while the rest secrete themselves in cars at a distance. The crane wranglers hide. Radios squawk. The familiar "Brrrrrrp" rises from the pilots as they thunder skyward, their motors sounding like sewing machines going full blast. Trikes and birds are up and away in the gray dawn!

But the birds wheel back over the field. Lishman and Duff swoop down like angry parents, sounding the crane call in desperation. The radios are punctuated with cries of agitated instruction: "Push 'em!" "Come in on the outside!" and finally "Jeez." The radio squalls, "They're landing!"

The trikes land. Soon the decision is made to pack up the "bad" (uncooperative) young ones in the crane trailer—soon dubbed the crane "camper." These birds will be hauled to the planned first stop—Hawk Field with its grassy airstrip, near Orono, Ontario, 15 miles to the east. Finally, a contingent of eight birds is pushed skyward.

Twenty minutes later, the airborne part of Operation Migration arrives at Hawk Field. Although the pilots think

the birds could have pressed on, the light is failing and the next planned stop is too far away to risk it.

The next day, October 25, weather conditions don't permit takeoff until 4 P.M. The trikes mount the air, and the birds follow in a splendid display of unanimity. But before long, Lishman's voice on the radio wails, "They're landing with a bunch of sheep!" The day's efforts have fizzled.

For the next three days, Operation Migration '97 is grounded by a combination of ice, snow and incessant rain. It is twilight all day long. The cranes are strolled out to the swamp, where they whisper and bustle among themselves, bobbing, feinting and jabbing, sometimes excavating the muddy ground, ever hopeful for worms.

In the motor home, a submarine atmosphere prevails. The human migrators settle in to read, eat, drink and fret for the next several days. Duff voices the motto of OM '97, "Here today, here tomorrow." Lishman calculates that at this rate, OM '97 is traveling a tenth of a mile a day.

But on the afternoon of October 28, the sky clears, the trikes taxi onto the field, and costumed wranglers position themselves to let the birds out. Clark takes off to assume his position as eye-in-the-sky, but when the plane is some 100 feet aloft, his radio voice, with unflappable airline captain equanimity, crackles, "Engine out." His trike heads for the ground—because—as Clark will later say, "It seemed a good idea to land." It is the first unplanned dead-stick landing for Clark after 41 years of piloting, which in addition to captaining 777s, included a stint as a fighter pilot during the Vietnam War.

Unhurt, Clark pushes his trike off the field for master-fixer and backup pilot Richard Van Heuvelen to tend. Duff and Lishman and the cranes, young and old, take off. But within a mile, a certain younger crane peels back. In the melee, as pilots and birds swarm, a voice on the radio shrieks, "I've hit one!" Crane 205, careening through the prop of Lishman's plane, is killed instantly. The crew is devastated—especially Duff—who had many memorable flights with Crane 205 before his own crash during the summer. Lishman ponders gloomily, "If this is the first 15 miles, I wonder what the rest will be like."

The next day, OM '97 follows the suggestion of behaviorist Ellis, who has joined the migration for a week as an adviser. The younger birds will be trucked to the next destination, the older birds to a nearby field where there will be nothing familiar on the ground for the birds to relate to. Crane-suited wranglers, guided by Duff from the air, truck the older group to a just-harvested soybean field. Unfortunately for the hovering human fliers, the cranes have discovered the joys of shaking leftover soybeans out of their husks and throwing them around. It takes the Terrible Truck to oust them from the soybean playing field.

Miraculously, it seems, the flock covers the 29 miles to farmer John Johnson's airfield in about 40 minutes. Getting airborne the next morning requires defrosting the ultralight wings, only to have them frost over again until the sun rises to warm things. Duff and Lishman decide that the "bad guys" are Crane 213 and Crane 216. They are grounded—destined to be trucked to Virginia in the crane camper. The new plan is a variation on Ellis' suggestion. Lishman will take off with the other four younger birds from a field a half-mile away. Duff will climb the skies with the magnificent seven "good guys."

Again it looks promising—the four young ones take off after Lishman like real cranes, eschewing the temptation of another harvested field. Within minutes, Duff and the magnificent seven take off, gracefully avoiding one of the worst obstacles for migrators—a web of electric power lines.

But just as the younger birds reach Duff, streaking east, they break up, flying helter-skelter. For the next 40 minutes, Clark descends to a lower elevation, and he and Lishman and the younger birds dodge and dive, making no headway. On the radio, Lishman says: "They see the airstrip . . . they think they should land." The younger birds have doubled back to Johnson's farm. There, four more troublesome birds are packed up into the yellow crane camper. Somehow Duff and the older group have sidestepped the fray and are long gone.

The trikes take off and the birds follow in a display of unanimity. But before long, Lishman's voice wails, "They're landing!"

By noon the motorized end of OM '97 has reached farmer Dave Wight's private airfield on the edge of West Lake. The good guys have been frolicking in the lake's shallows for an hour and a half. They've flown a distance of 45 miles. The Wight family

In order to familiarize birds with a flying machine, a handler swathed in crane garb lolls beside an aircraft. This kind of repeated exposure is essential to the conditioning process.

are old friends of Operation Migration. It is here that the final scenes from the movie *Fly Away Home* were shot in the fall of 1995.

A flight pattern is starting to emerge among the older birds, Duff notes. As soaring birds, the cranes seek the slight lift off the wing vortices, which allows them to "sail." Six of the older group have always flown off Duff's right wing, led by crash-veteran Crane 201, the small male of Duff's August altercation. He often trades off with Crane 203, a dominant male, just as they would in a wild flock. However a female, Crane 206, although neither dominant nor aggressive, seems to fly to a different drummer. Perhaps she is the smartest, says Lishman, as alone and undisputed, Crane 206 "owns" Duff's left wing.

Later that same day, there is too good a tailwind to pass up. The planned air route will take us east over the town of Picton, passing south of the village of Odessa and landing on the northwest side of Loughborough Lake, near Kingston on the eastern tip of Lake Ontario. Duff and his seven briskly get going. Lishman and now three of the young ones (another culprit has been selected out) are off flying, too. Lishman radios to the ground crew, "I don't want to be presumptuous but it looks like we've got everything going here . . . you can pack up and go!"

But as the motorcade stops for gas, Lishman suddenly exclaims, "We're headed for the main street in Picton!" Three crew members grab crane suits and, "Brrrrrrping" like mad, run across the street to a convenient vacant field, waving and calling the birds down. The incorrigible younger birds finally land, allowing themselves to be herded into the crane camper with the rest of the malcontents.

The motorcade end of OM '97 slinks out of Picton, bound for Loughborough Lake. Joe Duff, as it turns out, is already there—in the company of the seven reliable fliers. "Where the hell are you guys?" he inquires from his cell phone.

At dinner that night, we count our blessings: 1. The younger birds landed somewhere besides the runway they took off from; 2. They have advanced about 125 miles in the migration; 3. The older birds managed to fly 90 miles today—sometimes, Duff says, the birds were flying at 2,000 feet.

The cranes have discovered the lift they can get from the valley edges, and they break away to fly off at a much higher altitude.

November 1 dawns calm, bright and flyable. The airborne migrators—with Van Heuvelen piloting in Lishman's place—take off for the Canada-United States border. Despite advancing rain clouds, the airborne cross the shining St. Lawrence River, dotted with islands. Deftly skirting a herd of scattering deer, the pilots and cranes land at Watertown International in Watertown, New York, after 37 miles and almost two hours of flight time. The flight itself, the aviators later report, was a rainy one. Precipitation for an ultralight pilot, says Duff, is like getting pecked to death by BBs.

With several days of relentless rain, the town of Mexico, New York, the next destination—30 miles by air, 40 miles by land—seems impossibly remote. The younger birds leap and fret. It's another 380 miles to Airlie, Virginia.

After five days, the pilots claim the lemony haze to the east is dawn. By 3:24 P.M. the weather has moderated. The pilots and cranes lob off with alacrity from the soggy fastness at Watertown. The younger birds have been trundled off in their trailer; no one wants to take a chance with them this late in the day.

In waning light the airborne arrive in Mexico, at pilot Tony Bombardo's private field, in an hour and 48 minutes. The next day, at 5:45 A.M., a well-lit dawn gives promise of clear flying. Cranes 211 and 214 of the younger group will be given another chance to fly. As before, the younger birds will take off first with Lishman. Duff will launch later with the good guys. At first it looks as if it might work, but then the younger birds pull out, dragging back the older group. It takes another air scramble to separate the two groups before Duff can once again lock in the seven older cranes. He heads south while Lishman wrangles the hesitant two back to their camper.

But as the airborne group nears the town of Skaneateles, the pilots' radios crackle with observations that the cranes are coursing—flying at speeds of up to 40 miles per hour—and show little sign of tiring. The weather is great, there ought to be enough fuel, why not press on to Ithaca at the southernmost tip of Lake Cayuga? So after buzzing the small airport, OM '97 passes over the deep-green conifers and the bright-yellow splashes of maples of the last of the Adirondacks of New York.

After two hours and 36 minutes, the fliers—led by Crane 206—reach John Neno's private airfield, set in the middle of his 387-acre compound just outside Ithaca. The cranes seem overjoyed to slop around in Neno's pond. Rain allows the crew to spend the afternoon in the laundromat.

A day of rain, and the following morning, more rain. But by afternoon there's good weather at the Blue Swan Airport in Waverly, Pennsylvania, 36 miles south, the next planned destination. Despite shoaling wind from the beginning of the Appalachian ridges, the airborne head for Pennsylvania through a series of north-south valleys. The cranes, the pilots report, have discovered the lift they can get from the valley edges and break away to fly at a much higher altitude. Their descent at the Blue Swan Airport is achieved "with great reluctance." This is the halfway mark. OM '97 is 280 miles from Purple Hill, with 240 miles to go to Airlie.

Rain barges in the following day. The next destination, Jim Fink's field at Trout Run, Pennsylvania, is 50 mountainous miles away. And those mountaintops are obscured by a descending cloud ceiling. Waiting for the cloud curtain to rise, the younger birds get a turn in the air. And true to their past performances, they skate up in great form, take a turn and land as soon as possible.

There is a lot of discussion among the crew as to why the younger birds haven't "gotten it." One suggestion is that they didn't have enough training at the fledging ground in Canada. But this was the result of scheduling problems and a lack of money. OM '97—which lives on donations—simply couldn't come up with the $5,000 needed to get the cranes to Canada earlier. Fundraising is a phenomenon as unpredictable as the weather. The Ontario weather itself, too, had been unforgiving. Days of rain had cut into training time. And so had Joe Duff's accident. Even now his doctor insists that he should not be flying.

Early Monday morning, November 10, fog has started to blot out the mountaintops. As Duff takes off with the older birds, the air looks as rambunctious as an ocean. Viewed from the ground, Duff is a frail figure, climbing against the backdrop of surrounding mountains. The wind, coming at a 90-degree angle, bounces the ultralights and cranes over the ridges only to push them down again with a stern hand on the other side. Duff radios, "Let's find a place to land."

For Grover, Pennsylvania's Duane Taylor, out hunting on this November day, the avian creatures landing in his hayfield don't look anything like the turkeys he is stalking. To *Fly Away Home* movie buff James Weibley, 9 years old and poring over his homework, spotting OM '97's unscheduled landing is "the coolest thing that ever happened." After high tea and coffee, compliments of James' parents, Jim and Cathy, Lishman reconnoiters the air and says they should again attempt to reach Fink's airfield at Trout Run, 19½ miles away.

The takeoff from Taylor's field is effortless, and the team makes it to Trout Run without incident. Trout Run is the first stop of what Lishman and Duff call the "regular route." (In 1994 and 1995 Lishman and Duff and assorted

1997 Chevy Blazer turning stability claim based on USAC-certified dry lateral acceleration test. 1997 Ford Explorer braking comparison based on USAC-certified dry testing of 60-0 braking. The ABC's of Safety: Air bags. Buckle up. Children in back.

Got a craving for adventure and luxury? Treat yourself to the new Subaru Outback® Limited. On the outside, this unique All-Wheel Drive vehicle is more than a match for the competition, holding a turn better than a Blazer and braking better than an Explorer. Inside, the Limited offers deliciously decadent comforts like soft leather seating, woodgrain patterned trim and - count 'em - two sunroofs. To get a taste of The World's First Sport-Utility Wagon™, see your Subaru dealer, call 1-800-WANT-AWD or visit our website at www.subaru.com

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migrating Canada geese stopped here on their way south.) Jim Fink, owner of the Trout Run airstrip, reports that at least one Canada goose sporting an OM trademark yellow band had been seen earlier in the fall when other migrations were under way.

The next morning, the pilots are saying optimistically that perhaps they can make Gettysburg—a distance of 108 air miles! But the cranes will not be rushed; leaving Fink's requires a dose of the Terrible Truck.

On a practice flight, pilot Joe Duff soars into the sunset, a pair of sandhills flapping off his wing. Countless hours of such preparation have been critical to the success of OM.

The word comes to the motorcade that after 71 miles, the pilots, numb with cold, are making a stop at Dora Yost's hilltop airport at Shermans Dale, just west of Harrisburg. Two hours after they land, the motorcade arrives. By just after noon, the entourage resumes its flight to Gettysburg, 37 miles away.

But the ridges and mountains that lie ahead are like large malevolent speed bumps on an Interstate, trapping trikes and cranes with gusts of wind. To escape the turbulence coming from the ridges, the birds drop lower and lower. The radio announces another unscheduled stop. Lishman, searching for an available landing spot, radios Carlisle Airport, two miles to the east. Lishman: "We're on a migration from Canada and we have three ultralights and a bunch of birds. Is it OK to come in down there? Eh?" Carlisle Airport Fixed Base Operator: "Well, OK . . . You just do what you Canadians do . . ."

The reason for the unscheduled stop is that, in the heaving sea of air, Duff has hit Crane 203. But he is getting good at this; just as before, he purposely stalls the plane, and the bird breaks free. And at an altitude of 600 feet, there is no predatory tree waiting to grab Duff from the sky. As it turns out, Crane 203 has only a minor scratch.

The following morning, the takeoff from Carlisle looks to be perfect, but the pilots are taking no chances. OM has already left a message on the tape of the U.S. Ultralight Association in Rockville, Maryland, in case we need help: "Four airplanes, ten people and 13 cranes are on the way."

Although Gettysburg is only 10 miles by air and 30 by road, the route also includes ornery Appalachian ridges known to earlier OM migrators. The pilots are whacked around like shuttlecocks in the buffeting wind. And it has begun to snow.

But by late afternoon, the planes, cranes and trucks are comfortably tucked away on the private runway of John and Liz Brown in Gettysburg. This is the fourth time OM has dropped in on the Browns, who cheer up the crew with food and drink. The forecast indicates a week of gray winter skies. It is still 77 miles to Airlie, Virginia.

Early the next morning, though, the storm seems to be holding its breath. At 7:43 A.M. the pilots decide that this is their last chance to get out. Airborne OM finds a friendly tailwind, which gives the travelers a ground speed of more than 40 mph. They fly over the familiar terrain of earlier migrations—Frederick, Maryland, the horse country of Northern Virginia, skimming an eastern ridge of the Appalachians—dead on for Airlie. The motorcade rolls along the circuitous roads of that backcountry.

The pilots' radios buzz that what looked like a duck closing in from the east, now flying 100 yards from OM '97, is a Canada goose. Although it is not wearing the telltale yellow neckband of a former OM migrator, and the pilots can't see if its leg is so marked, could it be a fellow traveler from years gone by? Like someone who has lost a place in line for some pivotal performance, the goose switches back and forth among the procession of cranes. But as its actions scatter their symmetry, it seems to take the hint and backs off. For another 20 miles, however, the goose does not give up, flying at a respectable distance before discreetly dropping out just two miles short of OM '97's historic landfall. We reach Airlie, Virginia, at 9:30 A.M. We have flown away home.

Adele Conover, a frequent contributor to SMITHSONIAN, *specializes in the sciences, especially wildlife biology. Joseph Duff, in addition to being an ornithological activist, is an award-winning photographer.*

to sleep perchance to dream
perchance to mess with reality

fantasy is just another word
for fearless there will always be
a place in the world for rebels
the key to creativity is yanking
convention inside out

do you dream in sony?

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SONY

REALLY GOOD POSTERS HAVE A WAY OF STICKING WITH US. A FEW, PERHAPS ROLLED UP AND dog-eared, have been just too hard to toss out as we pack and unpack our way through life. What New Yorker doesn't remember the priceless advertisement for rye bread—"You don't have to be Jewish to love Levy's"—that brightened grimy subway platforms for years? Or how about the '60s rock posters from the Fillmore and other San Francisco haunts, hawking concerts by Jefferson Airplane, the Grateful Dead, Jimi Hendrix and other legends of that psychedelic decade?

These are among the 120 classic posters—once considered ephemera, now considered collectibles—in an exhibition entitled "Posters American Style" at the National Museum of American Art (the show will later travel). Guest-curated by Therese Thau Heyman, who also wrote the exhibition catalogue, the show covers the century from 1895 to 1995. The posters shown here were the kickoff, as inventive graphic artists such as Maxfield Parrish (whose 1897 lithograph for the Adlake Camera is shown below), Arthur Wesley Dow, Florence Lundborg and Edward Penfield borrowed freely from Art Nouveau, Japanese design and photography. They set the aesthetic bar very high for their successors; come to the exhibition and judge for yourself whether they measured up.

And, in the meantime, where *did* you stuff those rolled-up old posters the last time you moved?

—*Constance Bond*

POSTERS

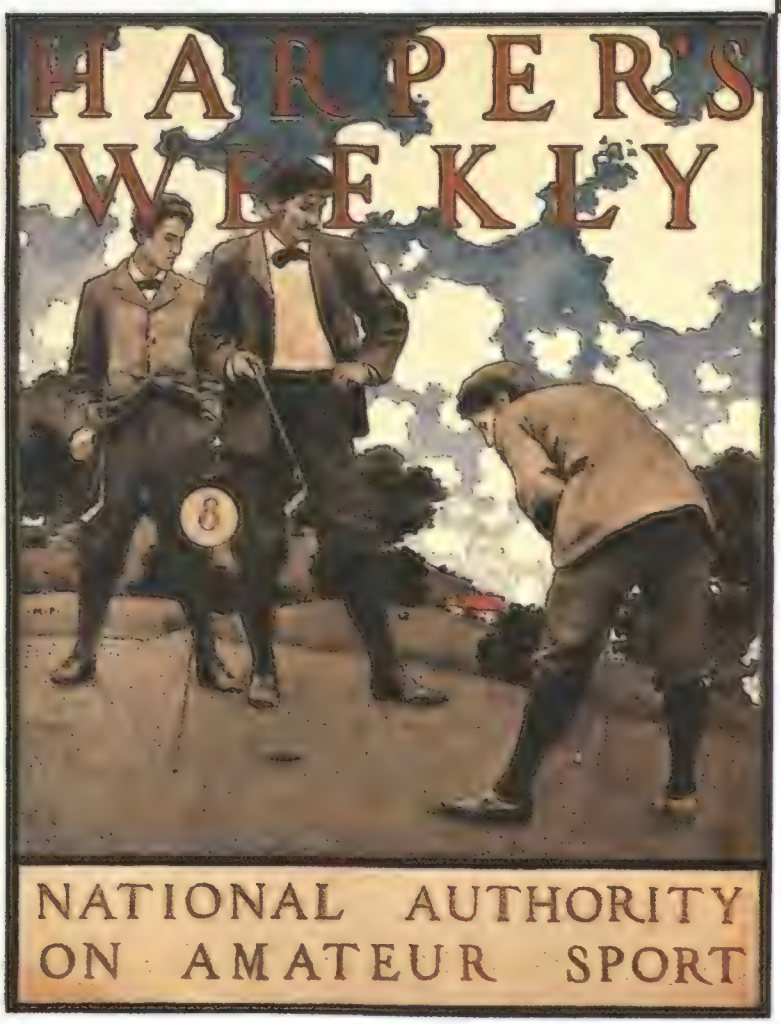
AT THE NATIONAL MUSEUM OF AMERICAN ART

American CRESCENT
Cycles
'99
Ramsdell
N°33
CRESCENT
WESTERN WHEEL WORKS
CHICAGO
U.S.A.

AMERICAN CRESCENT CYCLES (OPPOSITE), a lithograph almost six feet high, was designed in 1899 by Frederick Winthrop Ramsdell. Like many of the other early poster artists, Ramsdell was a portrait and landscape painter who studied in Europe, then returned to the United States. When advances in printing technology made it possible to inexpensively produce multiple copies of large-format color pictures, Ramsdell and other artists were inspired to work in the new medium.

IN 1895, ARTHUR WESLEY DOW'S WOODcut for *Modern Art* was reproduced in a 20-inch-high color lithograph (above) and given to the journal's subscribers. Dow, an artist whose deep interest in Japanese art is apparent in this poster, was also an important educator who taught at the Pratt Institute and the Art Students League in New York City. Edward Penfield, who produced the color lithograph *Three Gringos* (left) in 1896, studied at the Art Students League and later became the art director at *Harper's* magazine. He designed a series of monthly promotional posters for *Harper's* that were widely circulated. Among the sources for his work were French artists Paul Gauguin, Henri de Toulouse-Lautrec and Jules Chéret, as well as Japanese prints.

NATIONAL MUSEUM OF AMERICAN ART; DELAWARE ART MUSEUM



TO ADVERTISE THE NOVEMBER 1895 ISSUE of *The Lark*, a humor and literary magazine, Florence Lundborg created a dramatically colored 16-inch-high woodblock print (above, left). Lundborg was influenced by the Arts and Crafts movement in San Francisco, where she was born. *The Chap-Book: Thanksgiving Number, 1895* (above) was designed by Boston-born William Bradley, who is credited with introducing the Art Nouveau style to the American public. Maxfield Parrish was only 27 when he designed the *Harper's Weekly* poster at left, featuring a golf game. Born in 1870 in Philadelphia, he studied at the Pennsylvania Academy of the Fine Arts and with the renowned illustrator Howard Pyle. Parrish became one of the most prolific American poster artists.

OAKLAND MUSEUM OF ART; BALTIMORE MUSEUM OF ART; VIRGINIA MUSEUM OF FINE ARTS

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BY CHRIS GRANSTROM

They live and breathe LETTERBOXING

PHOTOGRAPHS BY PATRICK WARD

AN OBSCURE GROUP OF INTREPID COLLECTORS GIVE THIS ENGLISH VERSION OF ORIENTEERING THEIR HEARTY STAMP OF APPROVAL

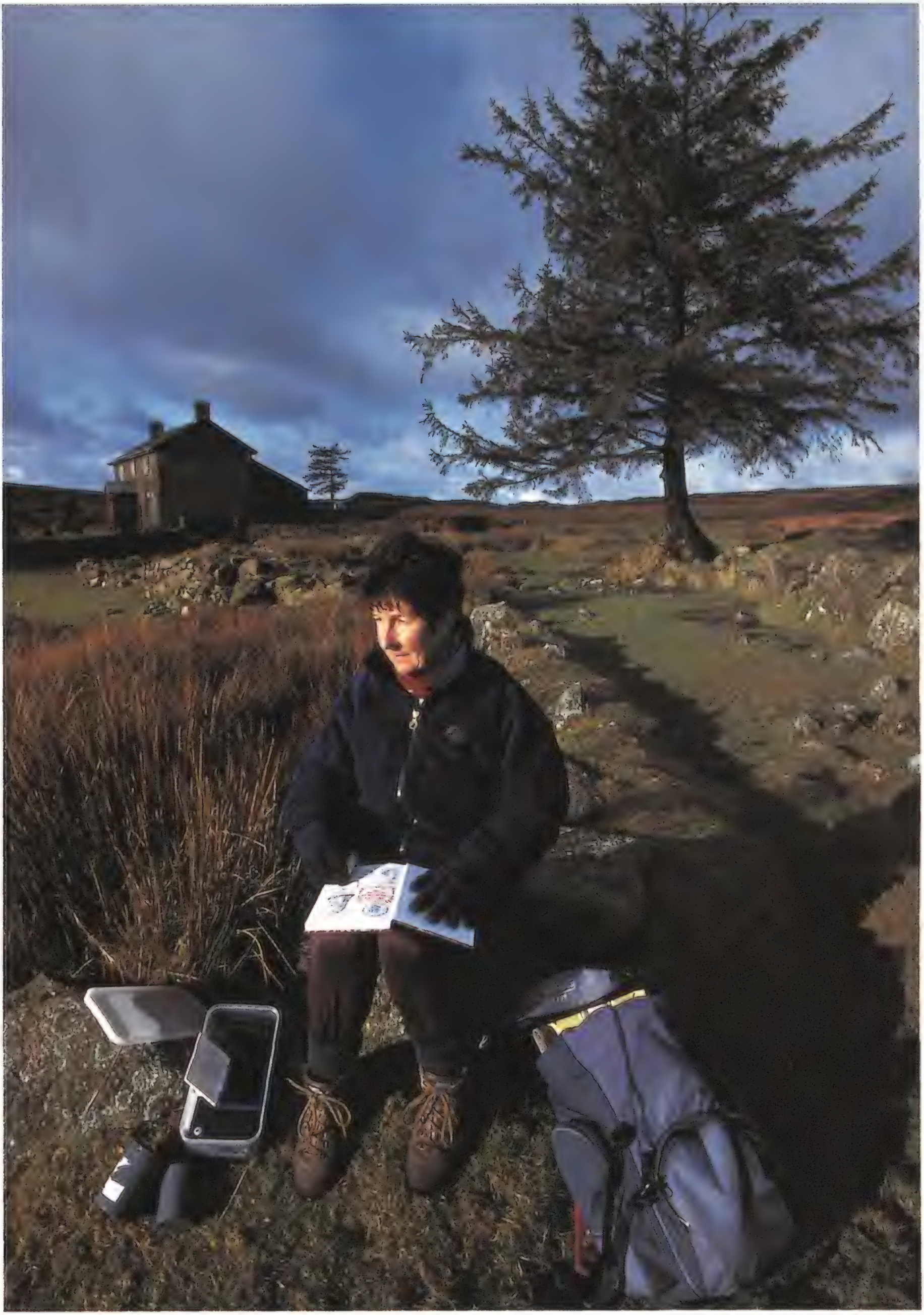
ADRIAN WILLIAMS IS AN ENGLISHMAN WITH A MISSION you might call an obsession: to find plastic containers that are hidden under rocks. He is in his early 40s, and carries on with a bluff manner and considerable energy. He has worked as a garage manager, a nurse and a Web-page designer but devotes his free time almost entirely to this pursuit. The hidden containers—they're known as letterboxes—are scattered through the wild country of Dartmoor National Park, a vast region of high, barren hills in the southwestern English county of Devon. Adrian is one of several thousand people who have taken up the search for them. He told me that when he moved from London to Devon a few years ago, he'd never heard of letterboxing. Now, whenever he can, he leaves home early to get to the moor, comes back late and spends his evenings on the phone talking shop with other "boxers," or entering new clues into his computer database. "I live and breathe letterboxing," Adrian said. "It's a way of life for me, and I'm not the only one." Letterboxing is something between a sport and a hobby, sort of a combination of orienteering (SMITHSONIAN, June 1992) and treasure hunting that consists of using maps, clues and compasses in the search for containers. Each letterbox contains a notebook and a unique rubber stamp. Each letterboxer carries a notebook and a personal stamp.

Once a box is found, a small ritual called "stamping up" is performed. The letterboxer inks the stamp from the box and presses it into his own notebook, then inks his personal stamp and presses that into the little visitors' book that's kept in the box. It's double proof that he's found the box. The stamp copy he takes home is the reward for his effort. Then the letterboxer reseals the box, replaces it in its hiding place, checks the clue sheet and the compass bearings, and heads off in search of the next letterbox.

There are thousands of boxes hidden on Dartmoor. They've been put out a few at a time by letterboxers themselves. The whole thing goes on without any governing body or official sanction. It came into being spontaneously, and it's the people who participate that keep it going. Anyone can go letterboxing, any day of the year.

Adrian, his wife, Melissa, and their children, 11-year-old Tegan and 8-year-old Ben, were heading out one Saturday last November, and they invited me along. On our way

After finding the letterbox near Nun's Cross Farm, Pat Clatworthy uses her personal stamp (at left, above) to "sign" the visitors' book, and records the letterbox stamp in her notebook.



Letterboxers trace their curious hobby back to 1854, when a Victorian gentleman walker put his calling card in a bottle and stuck the bottle into a bank in a remote part of Dartmoor.

While his Border collie, Poppy, waits patiently, Adrian Williams collects a stamp on the monument that commemorates the first letterbox, which is located at Cranmere Pool.

from the Williamses' house, in the town of Okehampton, to Dartmoor, we drove down lanes in the Devon farm country so narrow that ferns growing out of the stone walls brushed against both sides of the car. We eventually went through a gate, followed a track to the edge of the moor, where we parked, and started hiking up a boulder-strewn hillside. Some shaggy cattle ambled off before us.

Adrian said that when he gets in a new place, it takes a little while for him to get a feel for where things are and how to interpret the clues. Before long, he announced that we were in an area that was heavily salted with letterboxes. (It should be pointed out, however, that someone who was not looking for them could hike on this hill for years and never see a letterbox.) He read from a set of clues: "Hut at 113 degrees. Cairn at 108 degrees." He looked around and located what he thought were the hut and cairn referred to in the clue. The cairn was just a hundred yards up the hill; the hut was more than a mile away.

Adrian judged where he would have to put himself so that his compass readings to those two landmarks would match the ones specified in the clue. "Should be just over that way," he ventured. Melissa had a somewhat different idea about where those bearings would cross, but she only rolled her eyes and said to me in an undertone: "How many letterboxers have divorced over a difference in bearings on Dartmoor?"

In a couple of minutes, Melissa pulled the box from under a rock, and we all settled on our haunches to stamp up. Most letterboxes are actually pill bottles—plastic screw-top containers, about three inches in diameter by four inches high, that were originally used to supply pharmacists with wholesale quantities of pills. These are weatherproof, plentiful and free for the asking. We had our first box of the day, and Adrian announced, "We're off. Now we're in form."

The British are known for eccentricity, but letterboxers, one aficionado told me not long before I went afield with

Shirley Perry sights through a compass to get a fix on her bearings.

the Williamses, are the greatest eccentrics of all. They trace their curious pastime back to 1854, when a Victorian gentleman walker put his calling card in a bottle and stuck the bottle into a bank at Cranmere Pool in a remote part of Dartmoor. Other walkers who found the bottle also left their cards, and perhaps a postcard that the next walker could carry off the moor and send back to its owner. In 1894, a letterbox appeared at Belstone Tor. (A "tor" is a hill marked by a rocky outcropping. There are about 140 on Dartmoor.) In 1938, another was placed at Ducks' Pool.

As late as the 1970s, there were only a few dozen letterboxes on Dartmoor, though by then rubber stamps had replaced calling cards and postcards. In the past couple of decades, the number of boxes has exploded, while at the same time boxers have tried to keep the whole thing quiet. Most letterboxers live in Devon, though some come from other parts of England and a few even come from other parts of the world.

With the exception of a compass and the rubber stamps, there is refreshingly little gear to buy. The only "currency" is the clue sheets that lead to newly placed boxes—the owner can exchange these for clue sheets leading to other people's boxes. An organization called the 100 Club publishes a catalogue of some of the letterbox clues. These clues don't exactly pave the way to the letterboxes. Here are a couple I picked at random from the catalogue:

"Favourite Lunch Spots No. 22. Shapley Tor. Lone tree by road 312 degrees. Huge square boulder 346½ degrees. Hut circle 277½ degrees."

"Reynard's Happy Hour. Bellever 341 degrees. Hay Tor 51 degrees. Track disappears over hill 101 degrees. Under large rock half covered with heather."

And just to spice things up, some clues include cryptic references, or come in the form of anagrams. The 100 Club sells patches that advertise that the wearer has found 100 boxes, 500 boxes and so on.

The rubber stamps used in letterboxing have become increasingly (and competitively) elaborate. Many boxers put out series of stamps that commemorate some aspect of Dartmoor. Adrian has just put out a series on places with local bird names, called "Dartmoor Most Fowl." Roger and Stephanie Paul of Denbury have put out a series called "Dartmoor Farmers, Past and Present." Some artistically inclined boxers carve their own stamps out of rubber blocks; these "handcuts" are especially sought after.

By the time Adrian and Melissa had found that first box, we'd come well up the hill. Looking back, I could see the green and hedged farm country just below us. Farther off was the city of Plymouth and the entrance to Plymouth Harbor. As I watched, the distant mist rose, revealing a silvery sheen on the water of the English Channel. The clouds above it looked ominous.

But the sun was shining where we were. It was a good area, and there were boxes to find. We worked our way to the top of Stalldown Barrow, picking up five or six more boxes in the next hour. Only once did we see another walker, several hundred yards off. Adrian guessed that she was a letterboxer; she veered away when she saw us.

In fact, letterboxers seldom cross paths out on the moor, though the keen ones get to know each other nonetheless. When they find a box, they look to see whose personal stamps are already in the notebook. Being first in the visitors' book carries high prestige. Though they may never meet or even know each other's real names, the regular group all know each other by the nicknames on their "personals," which often include a play on the boxer's name or hometown: the "Topsham Torists," the "Dartmoor Carterpillar," the "Plymstock Soggy Soxers." The Williamses' personal reads "Have Feet Will Travel."

The typical letterboxers are probably a family with children who have gotten their hands on the 100 Club's catalogue and have trekked out to the moor with a compass and a picnic lunch for a day of fresh air and adventure. But a small group of the keenest boxers also go after "word-of-mouth" boxes. These are letterboxes that aren't mentioned in the catalogue and whose owners circulate the clues only to other insiders.

A strict protocol applies to clue exchange. One never asks for another's clues. You can offer your clues, but only if you've been around long enough to have the idea that your clues will be accepted. The exchange of clues often starts at the pub and continues by mail. Adrian checked the clue sheet we were using that day, and said that we should head over to the northern side of Stalldown Barrow and down into the valley.

As we walked, we could see a row of standing stones left by prehistoric people. Some of the ponies that wander free on Dartmoor had worked their way among the stones, and from where we were, clumps of ponies and the standing stones alternated across the horizon. We walked on till we came to the steep slope on the far side of Stalldown Barrow. The River Erme snaked through the valley at our feet. A "tail" of white water marked each boulder in the river. Up the mottled slope on the far side of the river, more than a mile away, we could see a farmer on an all-

terrain vehicle herding sheep. With the help of a pair of energetic Border collies, he gathered the sheep toward the corner of an ancient stone wall. We could just hear his shouts to his dogs, and the sheep, which had been scattered specks on the hillside, coalesced into pools of white with tributary streams.

But we weren't there for sightseeing—there were boxes to find. We slogged our way down the hill (Dartmoor is almost uniformly wet underfoot) to a rocky gully called Smuggler's Hole. It was another rich area for letterboxes. Adrian and Melissa found a couple of boxes by using clues. Tegan found a couple just by looking. "That's two to Tegan," Adrian called. "Come on, Ben, you're lagging." Adrian checked through the notebook that he'd taken from one of the boxes we'd found. He recognized all the stamps.

Taking shelter from the wind, Roger and Stephanie Paul examine a clue sheet in the ruin of a 19th-century mine house. The two of them have been "boxing" for 14 years.

"It's the usual gang," he said. Then, using the felt-tip markers he had brought for just this purpose, Adrian spent a good ten minutes coloring this stamp—it was a picture of a swashbuckling smuggler—so that he would have a particularly attractive copy for his collection. Some of the more serious letterboxers like to take copies of stamps on note cards, which they later sort and mount in binders. "When you look at your collection of stamps on a winter's evening," Adrian said, "it gives you something to remember: who you were with, and how you found it." We got a few more stamps in the gully before the storm that I'd seen earlier out on the English Channel broke over the top of Stalldown Barrow. Gusts of rain started to lash us. Even Adrian, who had told me earlier that a letterboxer's unfailing motto is "Just one more box," admitted that it was time to quit. We pulled up our hoods, put our heads down to the storm and followed a trail along the River Erme back to the car.

Once in the car, Adrian and Melissa looked through the stamps we'd collected, a total of 20. They included pictures of a fox peering from its den, a row of standing stones (a handcut), three different versions of smugglers and a female short-eared owl. There was also a stamp commemorating Her Majesty's Customs and Excise service; it was found in a letterbox hidden under a rock overlooking Smuggler's Hole. The verdict on the day? Not bad.

Pat Clatworthy has collected thousands of stamps in her 18 years of boxing, though she goes out only on weekends. Pat is a trim, vigorous woman of youthful middle age who works for the emergency-preparedness office of the Devon County Council. She agreed to take me out one day in sunny weather that contradicted Dartmoor's reputation for rain and gloom.

Pat started off at a brisk pace, providing a commentary over her shoulder as she walked. "Letterboxing seems to satisfy a lot of human traits," she said. "It gives a sense of adventure, a sense of achievement and satisfaction to collectors. You're pitting your wits against someone else's. And it's a great leveler: you'll see a doctor out talking over clues with a Boy Scout. I think it's good for the Boy Scout, and it's especially good for the doctor."

We passed Nun's Cross Farm, one of the old Dartmoor farms that's been abandoned this century, a victim of the poor, acidic soil and the harsh climate. Using the stone cross and a fir tree for bearings, Pat soon located a box. With the alacrity that comes of long practice, she unloaded her pack for the stamping up: a plastic pad to sit on; two plastic containers filled with cards, ink pads, markers and her personal; a notebook wrapped in a plastic bag; and a thermos of tea.

"Coming out for a day of letterboxing is like planning a battle campaign," Pat said. "I'd feel lost without my pack of gear." (Pat is also a World War II buff.) Her other crucial piece of equipment is a golf club handle minus the head. She uses it to probe for boxes under rocks and in mossy banks, and as a walking stick. She pokes ground that looks soft before she steps. "It stops you from walking into suspect bits," she said.

We rambled on for several miles, finding boxes here and there, until we reached Ducks' Pool, the second-most-famous site on Dartmoor after Cranmere Pool. At neither

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Even though letterboxers tend to avoid each other on the moor, a group congregates every Wednesday at the Dolphin Hotel in the town of Bovey Tracey.

of these locations is there a pool, nor much of anything to distinguish the area from the miles of surrounding grassland, other than its letterboxing history. These are the sites of the two letterboxes that are shown on the map of Dartmoor. And on the ground, small monuments make the letterboxes impossible to miss.

Plenty of people around Dartmoor think these should be the only two letterboxes. The very eccentricity of letterboxing seems to breed suspicion among people who don't participate. This comes out, partly, in accusations that letterboxers trample vegetation and disturb antiquities. For their part, park officials have responded by consulting with boxers and publishing a code of conduct—which seems to be well heeded. I noticed that boxers don't mind pointing to the damage done by foxhunters and trail riders. The horseback riders point at mountain bikers and hang gliders.

The farmers who have rights to the common grazing land on Dartmoor (they're called "commoners") worry about recreational users disturbing their livestock. Few people seem happy about the presence of the military, which trains regularly on Dartmoor. A park ranger I talked to said that a big part of his job is balancing the claims of various users—a job made somewhat trickier by the fact that the land within park boundaries in Britain remains in private ownership. I heard a cockeyed rumor in a pub one night that the Prince of Wales, who is the largest landowner on Dartmoor, wishes that the whole place would become a strict nature preserve. I quickly got the impression that whichever group of users was looking at Dartmoor could see very clearly the damage—real or supposed—that every other group was causing. It was not long before I got a taste of this myself.

Using compass bearings, Pat and I came to Ducks' Pool across an unmarked grassy plain. We hadn't seen another person for hours, but as we approached we saw a man coming from the other direction, apparently also making for Ducks' Pool. I hung back a bit, to observe this meeting. Pat kept to her own business, avoiding conversation. I finally came up and the man hailed me cheerily. He looked to be about 60, and had a rosy complexion and white hair. He told me that he'd just walked eight miles, and there was sweat on his brow to prove it. "This your first time here?" he asked. Well, that's a friendly opening, I thought, but I had misjudged my man. He turned out to be an anti-letterboxer on the lookout for a victim. I had walked into his trap.

"Look at this photo." He thrust it under my nose. It showed three young women having a picnic by the Ducks' Pool rock. "This was taken in 1957. Look at the erosion that's been caused by letterboxers since then. The ground around the rock was way up here, then. Look what's been lost!" Pat started to say something about natural erosion, but the man would have none of it, and continued his harangue. Finally, he seemed to have judged that he had browbeaten us into submission. He glanced at his watch. "Twelve miles to go," he said. "I'd better be off if I'm going to make it home by teatime." And away he strode over the hill.

Even though letterboxers tend to avoid each other on the moor, a group of them congregates every Wednesday evening at the Dolphin Hotel in the town of Bovey Tracey. It's a friendly, noisy gathering, and a good place to hear letterboxing stories. I met Godfrey Swinscow, who seems to be the unofficial godfather of modern-day letterboxers. He told me that he'd found his first box in 1935. "Letterboxing is better than watching the telly," Godfrey told me. "It keeps the boys out of the pub, and the girls from chasing the boys." Not that Godfrey minds some good fun. I heard about a practical joke that some still-undiscovered boxers once played on him. He went out one day on the promise of finding a new box with an especially nice stamp. Along the way, he collected a series of notes with progressively outlandish directions. Being a good sport, he followed the directions until eventually he

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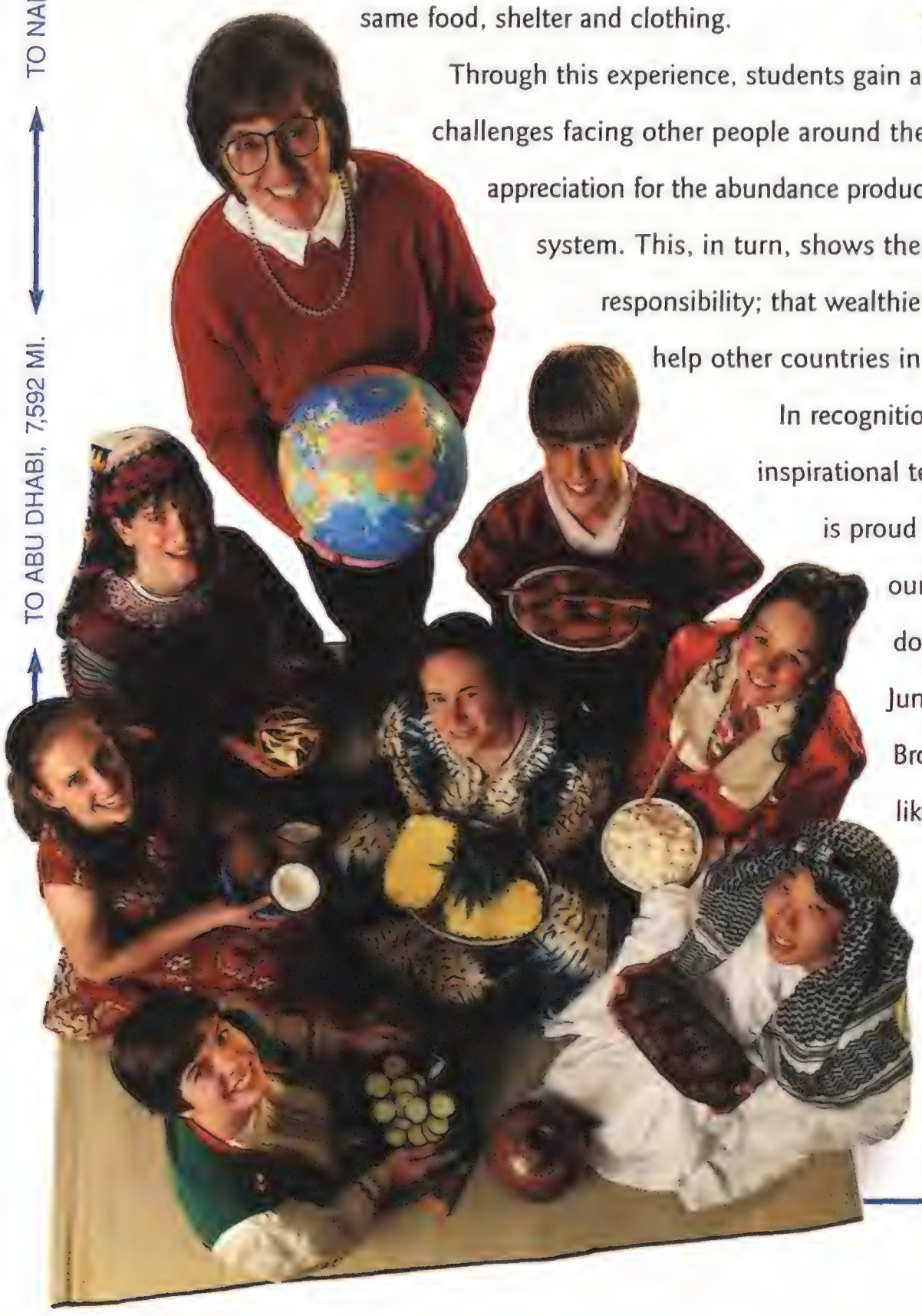
And that's just the way she wants it.

To help her ninth grade Geography class understand how different countries and cultures cope with the difficulties of day-to-day living, Mrs. Campbell has her students "live off the economy" of various nations. Students assume the identity of someone in another country and, for one week, attempt to live as that person would—using the same food, shelter and clothing.



Through this experience, students gain a better understanding of the challenges facing other people around the world and a greater appreciation for the abundance produced by the American economic system. This, in turn, shows them the need for global responsibility; that wealthier nations can—and should—help other countries in need.

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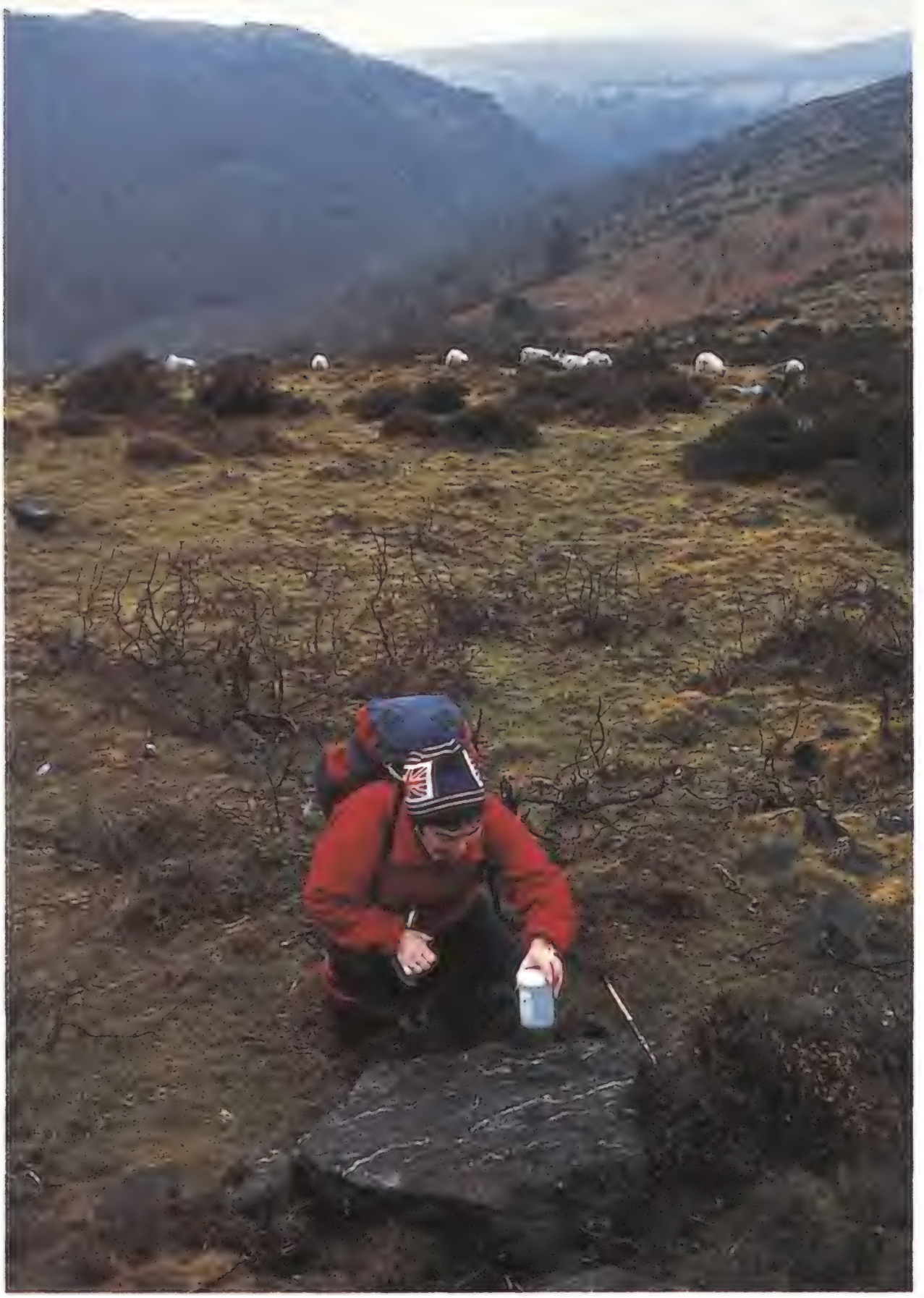
Being a good sport, he followed the directions until eventually he found himself walking across the moor, dressed in a frock and bonnet, chanting, "I believe in fairies and pixies."



Shirley Perry lays down her yellow-and-black walking stick to retrieve the letterbox hidden at Doctor Blackall's Drive, under the "squarish rock" described on the clue sheet.

ended up walking across the moor, dressed in a frock and bonnet, chanting, "I believe in fairies and pixies."

I heard about the boxer who had let it be known that he was planning to set out a new box at a certain spot at midnight on New Year's Eve. When he got to his spot, 45 minutes late, he came upon three cars full of cold, impatient letterboxers waiting in the dark for the chance to be first in the book.

Chris Jones told me that he thought there were maybe 60 to 100 "hard-core" letterboxers. "A lot of other people do it for their kids," he said. "That's fine. I won't decry that." But only a hard-core boxer would put himself in the position that Chris did one day. He needed two more boxes to complete a series and found himself on the wrong side of a river on a day when the rain was "bucketing" down. He and his partner walked along the riverbank for a mile, looking for a place to cross. "The river was in full spate, really flowing," he recalled. "Finally we just waded in, went up to our thighs. As wet as we were, what had we to lose? And how would we ever live it down if it got around that we were beaten by a little bad weather?"

Earlier, Pat Clatworthy had presented me with a North Dartmoor Official Passport, a whimsical document that ensured my protection from "Pixies and many other obscurities." In spite of that small honor, I got the feeling people in the pub were keeping an eye on me, not in any hostile way but out of a concern that my presence might foretell the arrival of crowds of heavy-footed "grockles"—a word from Devon for people who aren't.

A day later, I was alone on the moor, a clue sheet (solemnly lent to me by Adrian) in one hand, the map of Dartmoor (it measures approximately three by four feet when unfolded) in the other. I checked the sheet and found a set of clues that started from the eastern corner of the abandoned Doe Tor Farm. I located the farm on the map, hiked up there and read the clues.

"Go 132 paces on 107 degrees to tree." I aligned the compass with north, took a sighting on 107 degrees, and there was a gnarled hawthorn tree. My spirits rose. Adrian had

warned me that "paces" is a notoriously subjective unit of measure, but 132 of my paces brought me to within a few feet of the hawthorn. I felt like a child playing find-the-thimble when everyone starts shouting, "Warmer, warmer!" Last clue: "Box is 12 paces from tree on 280 degrees in clitter" (a Devon word for a jumble of broken rocks). Standing next to the tree, I used the compass to find 280 degrees, took 12 steps in that direction and looked down. My eye caught a hint of something man-made—the box. I took a copy of the stamp. My first solo letterbox!

Godfrey Swinscow, who began collecting in 1935, enjoys one of his notebooks.

Then I checked the clue sheet and found one of Adrian's boxes listed. I knew he'd be pleased if I stamped his book, so I decided to try for it. Here is the clue, verbatim: "Dartmoor's Lost Unicorns No. 5—Hero, 5377, 8473, Have Feet Will Travel, FP 205 degrees. Cross 18½ degrees. Large chimney on farm 241 degrees. Tip of dead tree 315½ degrees. Tip of pointed rock 70 degrees and 9p away. Under rock on edge of clitter." The name of the stamp comes first: Dartmoor's Lost Unicorn No. 5—Hero. Adrian's code name is Have Feet Will Travel. The two four-digit numbers, 5377 and 8473, are the map-grid references; using them, I got myself into the right neighborhood.

Once I was in the right neighborhood, the stone cross on Brat Tor was the most obvious landmark. Again aligning my compass with north, I walked across a hill 40 or 50 feet until the cross bore on 18½ degrees. Now I had a line from me to the cross and beyond. I knew that the box had to be somewhere along that line. To find it, I needed to determine where another bearing in the clue crossed the line. I knew that "FP" stood for flagpole. I looked in the direction of 205 degrees and saw some vague smudges in the distance that might have been flagpoles. Or might not. I decided to try another landmark. "Tip of dead tree 315½ degrees." I could see a cluster of trees around Doe Tor Farm a mile or so to the north, and one of them looked dead. I walked several hundred yards downhill, all the while keeping the cross on 18½ degrees until the dead tree was on 315 degrees. Good. I was standing at the intersection of those two bearings. The only trouble was, I was out in the middle of a grassy area, far from the edge of clitter. Obviously, I had picked out the wrong dead tree. Back to the clues.

"Large chimney on farm 241 degrees." I peered in the direction of 241 degrees. Ahh! Miles away, almost lost in mist, was a blocky shape that might have been a farmhouse. I couldn't make out a chimney, but this was the only possible choice. To put that farm on 241 degrees, I had to walk back uphill. That would return me to the clitter, which was good, but it would leave my precious dead tree way off the mark.

I walked up the hill, using the compass to check the stone cross and the farmhouse until I thought I was at the spot where their bearings crossed. I looked for a dead tree somewhere around 315 degrees. There were a couple of trees in the distance on the far bank of the River Lyd, but neither of them was close to 315 degrees, and neither appeared to be dead. So, what about that other clue—the pointed rock nine paces away on 70 degrees? I was surrounded by pointed rocks; it was the Times Square of pointed rocks. But as I was looking around, I saw, maybe ten feet away, a five-foot-tall dead tree. Adrian, you crafty bloke! Two steps put it on 315 degrees. A few minutes later, I pulled out the letterbox.

I couldn't find the next two boxes at all, but then I got two in quick succession. The next one would have taken me back up Doe Tor. By then the sky was getting "dimpsey"—another of those Devon words. I hadn't seen a soul in many hours, and no one in the world had a clue where I was. I gave up the idea of "one more box" and started back. Pausing on the side of High Down, I looked across the valley. It was a bleak, empty scene. As I stood there, a gibbous moon came over the shoulder of Doe Tor.

I had been out with Adrian near Doe Tor a few days earlier. We had stopped for lunch on the side of a hill called Great Kneeset. Through a notch on the horizon between Lints Tor and Black Tor we could see a bit of the lowland England where people live and work. "People down there, busy, busy, busy, rushing around," Adrian mused. What we could see of Dartmoor, on the other hand, was empty but for the two of us.

For millennia, the wet bleakness had kept people away. Traces of the few who had ventured onto the moor were still visible: the tinners had left piles of tailings; farmers had left stone walls; soldiers had left some rough roads and bomb craters; religious people had left standing stones and carved crosses. And, of course, letterboxers had been there, too. By then I knew that out in the wild country before us were thousands of pill bottles hidden under rocks. "It's a funny world," Adrian said, "isn't it."

This is the author's first SMITHSONIAN *feature. The photographer made his debut in 1982 in a picture essay on American eccentricities.*

On the eastern end of the Columbia Gorge,

Washington melts down into slabs of earth,

the river runs wide below and Oregon rises up on the other side.

When you stand on the bluff and look out at the world

it all comes together.

This is Oregon, the name that launched one of the largest overland migrations

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BY MICHAEL AGAR

TYING A KNOT—IT'S EASY, RIGHT? Once you get past shoelaces when you're a kid, you don't think about it much anymore.

But try it while floating underwater sometime, in a cave, loaded with enough gear to sink a raft, which I resemble at the moment, since I'm covered in rubber from the top of my head to the tips of my toes.

The line I'm tying is a tether to the air-filled world I was designed to live in. I'm floating, looking for a reliable nonskid rock; I have a metal reel full of nylon cord and a 50-watt light in one hand, the button to pump a squirt of air from the tanks on my back into an air bladder in the other. I'm trying to maintain enough buoyancy to effect zero gravity, so that I don't sink into silt and cloud the water or rise to the ceiling and break an elegant limestone straw.

I carry two tanks instead of one, each rigged with an independent regulator. I've got three lights, one primary light connected to a 12-pound battery box and two backups. I carry three reels, one to get me into the cave, a second to let me jump from one line to another (these lines have been strung through the cave's major routes), and a third for little problems that may come up, like getting lost. In this cave, there's no air, no light, no up, and maybe no partner, so redundancy and self-sufficiency are the name of the game.

The question is, what's a nice open-water ocean diver like me doing in a place like this?

The first answer is, I'm a statistic waiting to happen. Sheck Exley, a cave pioneer who recently died exploring a 1,000-foot-deep cave in central Mexico, developed what he called "accident analysis." Call up the "Cave Divers Corner" Web page on the Internet and treat yourself to what looks like a grim fascination with fatalities; in fact, cave divers excel in learning from their accidents.

A second answer is, I'm hardly the first diver to feel the pull. Martyn Farr's 1991 history, *The Darkness Beckons*, reveals that the attraction goes way back. As legend has it, Abe Davis, a slave in pre-Civil War Florida, covered 50 feet in an underwater cave just holding his breath; the National Speleological Society presents an award in his name to all who log 100 safe cave dives.

In 1922, Norbert Casteret, a young Frenchman,

NEITHER DARKNESS NOR SWIRLING SILT NOR AN ALARMING ACCIDENT RATE CAN KEEP DIVERS FROM EXPLORING THIS SURREAL LABYRINTH

PHOTOGRAPHS BY C. C. LOCKWOOD

Gary Walten (opposite) straddles a small cenote, a doorway to water-filled caves; here, he and his wife, Kay, drift in the Sac Actun system.

tucked a candle and matches under a bathing cap, hyperventilated for a two-minute breath hold, and plunged into a water-filled passage in a dry cave in the Pyrenees, feeling his way along the ceiling. He emerged in an air pocket and lit the candle, wandered a hundred yards until coming to a room with beautiful stalagmites, then dove through a second passage. His report: "The loneliness was tremendous; I struggled against an uneasiness slowly turning to anguish."

JACQUES COUSTEAU'S CLOSE CALL IN VAUCLUSE CAVE

A SECOND PIONEER WAS—WHO else?—the late Jacques Cousteau. His co-invention of scuba—self-contained underwater breathing apparatus—freed divers for the first time to explore caves without breath holds or clumsy rigs linked to the surface. He and his partner, Frédéric Dumas, dove the famous Fontaine de Vaucluse Cave in France in 1946. Their tanks, filled with contaminated air, almost killed them. As Cousteau later wrote in *The Silent World*, "Our worst experience in five thousand dives befell us not in the sea but in an inland cave." Serious cave diving came to the United States in the 1950s in northern Florida, near Tallahassee, with the early explorations at Wakulla Springs. Spectacular Pleistocene fossils were discovered; some of them found their way into museums.

So, I've decided to find out for myself what form of madness cave diving is. I have come to the coast of Quintana Roo, a state on the Yucatán Peninsula in Mexico, which is a hot spot for cave exploration. To the south lies Tulum, an ancient Mayan temple that overlooks the ocean. To the north lies Cancún, the Miami Beach of Mexico, a center of international tourism. The caves are caught somewhere in between. So are the cave divers, whose ranks once were limited to explorers but, with a rapidity that astonishes even them, now include more and more tourists.

My guides are Gary and Kay Walten, seasoned cave instructors and professional explorers. They deserted Baltimore in 1992 to feed what they call their "addiction." Since then, the two recently elected members of the Explorers Club have been involved in many of the significant explorations in the area. They're heading for their initiation dinner in New York in a few months and wondering if wet suits fulfill the "black tie" requirement.

My baptism started with the cavern zone. The "cavern" is defined as the area where natural light penetrates. "Cave" means no light at all. A cavern tour is available to any diver with a basic scuba certification, and dozens of them arrive every day in Cancún and Cozumel and book day trips to the area. But to leave natural light behind calls for advanced training, and that's the model Gary follows to introduce me to the caves.

He first ties off a reel on a sunken tree, keeping tension on the unrolling line as we head into the cavern. He makes the required secondary tie on a rock at the bottom of the drop; later he explains that you always tie off at a low point so the line won't float up to the ceiling or off to the side, into a line trap. We pass the sign that warns against entry for all but the trained and head into serious cave country.

We ascend a slight grade, find the end of the permanent line and snap the reel onto it. Now we're on the equivalent of a marked trail in the woods. Sometime in the mid-'80s someone first explored this cave, laying down the trail of nylon line as they went. Once the exploration ended and the maps were drawn, the cave turned from an unknown challenge into a tourist destination. The locals have dubbed it Carwash because taxi drivers from Tulum park at its edge to rinse dust from their cars.

We leave the warm green glow of the entrance behind. The only light streams out of the end of my primary light. Following the permanent line ahead of me, Gary kicks cave-style, short strokes mostly from the ankle. The point is to avoid aiming "fin blast" at the bottom, which could stir up silt deposits and ruin visibility.

I shine my light in different directions; on one side a flowstone, a slope of rock layered with a frosting of calcium carbonate, rolls by. On the other side textured spikes drip from the ceiling like frozen rain.

I'm surprised at how the cave

Backlit by a strobe, Jim Coke cruises a limestone passage of Mayan Blue Cenote; the nylon cord just below him is the "marked trail."

moves like a roller coaster, rising and falling instead of declining steadily into deeper water. Tunnels shrink and expand even as they change their shape, from roundish to oval to narrow slits. The tunnels lead to rooms with sheared walls and growths ranging from uneven bumps to melted spikes to weeping pillars.

Norbert Casteret might have freaked out in his cave by candlelight. Cousteau had a close call. And the endless accident reports will nudge and awaken the fear "gremlins" in any diver. (When I first met Gary, he told me there were three rules of cave diving. One, don't kill yourself. Two, don't kill anyone else. Three, see rules one and two.) But after this first dive, I'm hooked.

It's the strange beauty that's gotten hold of me. What kind of natural process caused all this? The Yucatán caves formed under an extensive limestone shelf. Rains laced with carbon dioxide from the air and soil percolated through the rock, forming a weak acid that hollowed out spaces under the surface. Rainwater, along with the groundwater, followed the path of least resistance as it worked its way to the sea; explorers now speak of "chasing the water," following the currents to find the next room. The thought that such mad, elegant beauty was sculpted using the principle of least effort is reason enough to repeal the Protestant ethic.

During the last ice age, ending about 10,000 years ago, sea level dropped and the caves dried out. But the rain didn't stop. And just as in dry caves like Mammoth in Kentucky, the raindrops solidified because of the calcium and bicarbonate they picked up as they worked their way through the limestone. The drops grew into formations—hanging stalactites, stalagmites growing out of the floor, columns and wavy draperies, hollow soda straws, flowstones and

Lone frogman Mike Madden glides past a fantastic formation he calls "The Ice Age"; it is in the Nohoch system, which he originally explored.

striped panels called "bacon strips."

The sea rose again and refilled the now "decorated" caves to produce the chaotic splendor that runs under the land. In the Yucatán, all the rivers are underground. Here and there, the "ceiling" over a river collapsed because of surface wear or because the underground water carved a dome, and the dome then worked its way close enough to the surface so that the ground fell in. This kind of gateway into the caves—a "sinkhole" in cave parlance—the Maya named *dzonot*, *cenote* (say-NO-tay) in Spanish.

The cenotes are deeply intertwined with Mayan culture, as I learn from Al Pertner, head of cave diving at a dive shop in Akumal, the town where I am staying. Al runs up while Gary and I are loading double tanks onto the back of his old pickup truck and says he wants to show me some pictures. And some pictures they are: perfectly preserved red clay pots lying in the silt, vertical lines painted on the side with a sun spraying rays in all directions.

Al will lecture at the University of Mérida the day after I leave. He'll describe the Mayan world view and call for protection of the caves because of increasing publicity. He looks at me across the top of his glasses as he says that.

THE CAVES WERE NOTHING LESS THAN PORTALS TO CHAC'S WORLD

FOR THE ANCIENT MAYA, THE WORLD we live on was just a thin crust over another, equally real, world below. The caves, drier thousands of years ago, offered shelter and water to the early arrivals. The "holy drip stone" became associated with the rain god Chac in his four forms, each a different color, each corresponding to a different point of the compass. In fact, the caves were nothing less than portals to Chac's world.

Funny how it's come around, says Al. The caves provided the first arrivals with shelter and water. Then they moved to the center of traditional Mayan cosmology. Now they provide shelter and water again: they're a source of revenue for the locals. But, Al notes, most local Maya just get the low-paying jobs, as busboys and maids. He gestures at the young dive shop staff in their blue T-shirts. Most are non-Mayan Mexicans or Anglos who migrated in for jobs; only one is a local Maya.

A short time later, I take the lead as we enter Chac Mol (Mayan for "jaguar"); this cave was first explored by Kay and Gary. We rise over a slope of boulders, pass under a low overhang, and float into a room that I can only describe as a cathedral from a religion that no one has founded.

At a depth of about 35 feet, a thin

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layer of water shimmers like a film of oil. On top of the film, little patches of water skid here and there, the nervous trails of invisible insects. When you're on one or the other side of the layer, and you look through it, things on the opposite side blur, like someone slipped a contact lens into the middle of the water and it's not your prescription. This is the "halocline," the boundary between fresh and salt water. The Yucatán caves are filled with both; the nearer to the coast, the higher the level of salt water.

With all the cenotes along the coastal road, you'd never guess that cave diving in Quintana Roo only began in the '80s. Two names, associated with two cave systems that play starring roles in recent events, are mentioned by virtually everyone I speak with. The first is Jim Coke, who is now studying for his master's in biology in Texas. Back in 1986, he heard about a cenote near a road that a mining company had recently cut into the interior. This cenote was actually a twosome—two watery eyes looking up at the sky. Hence the name Dos Ojos, "two eyes." Jim and his girlfriend, Johanna DeGroot, one of the first certified cave divers in Akumal, explored the cave for the better part of a year.

The other name is Mike Madden, who arrived in Akumal in 1982 after an injury as a professional sky diver. Madden opened a dive center at Aventuras Akumal, a new resort promoted by a Mexican developer. Working on a tip from one of his employees, he and some dive buddies hiked to an unexplored cenote and discovered Nohoch Nah Chich, Mayan for "giant birdhouse."

Both men love the caves and are explorers to the bone. But the two systems, lying side by side, spawned some serious competition. And their different personal styles foreshadowed current debates about the future of the caves—Coke, the diving loner, and Madden, the expedition organizer and businessman.

Today, much of the two cave systems have been mapped and lines have been laid. But the competition between the Dos Ojos and Nohoch exploration teams had its nasty moments. Here's why. When a connection is found between two cave systems, the smaller cave system becomes part of the larger one. So, the first order of business is to establish that "my cave is bigger than your cave," and the coin of the realm is the total length of line from the entrance to the farthest reaches of the system. Nohoch was listed in the 1997 *Guinness Book of World Records* as the longest underwater cave. But when I visited, both systems were said to have about 200,000 feet of line—together meandering beneath 20 square miles of land. That's a lot of cave.

Since the two systems, Dos Ojos and Nohoch, sleep in the same limestone bed, logic dictates that, somewhere, they must be connected. So the second order of business was to find the link.

The race was on, culminating in 1996 after a Dos Ojos team that included Kay Walten found two closely spaced cenotes. One belonged to Dos Ojos; the other, to Nohoch. Unfortunately, there was no way to swim between the two, so the Dos Ojos group ran a line up and out of one cenote, across land, and down into the other, arguing that geological evidence suggested a onetime link. Madden disputed the finding. The point, he noted, was to find the underwater connection, not to cover ground where an underwater link may have once existed. Charges and countercharges flew back and forth.

As a curious group of tetras looks on, a diver touches bottom, stirring up the heavy layer of silt that lies at the bottom of many of the caves.

Today, everyone agrees that those squabbles are over. Instead, all hands mourn for the lost "purity of exploration," a phrase that pops up all the time. As Gary puts it, while we drive to Gran Cenote in his pickup, the flatbed behind us loaded with double tanks and other dive gear, "My favorite cave is the one with no line in it."

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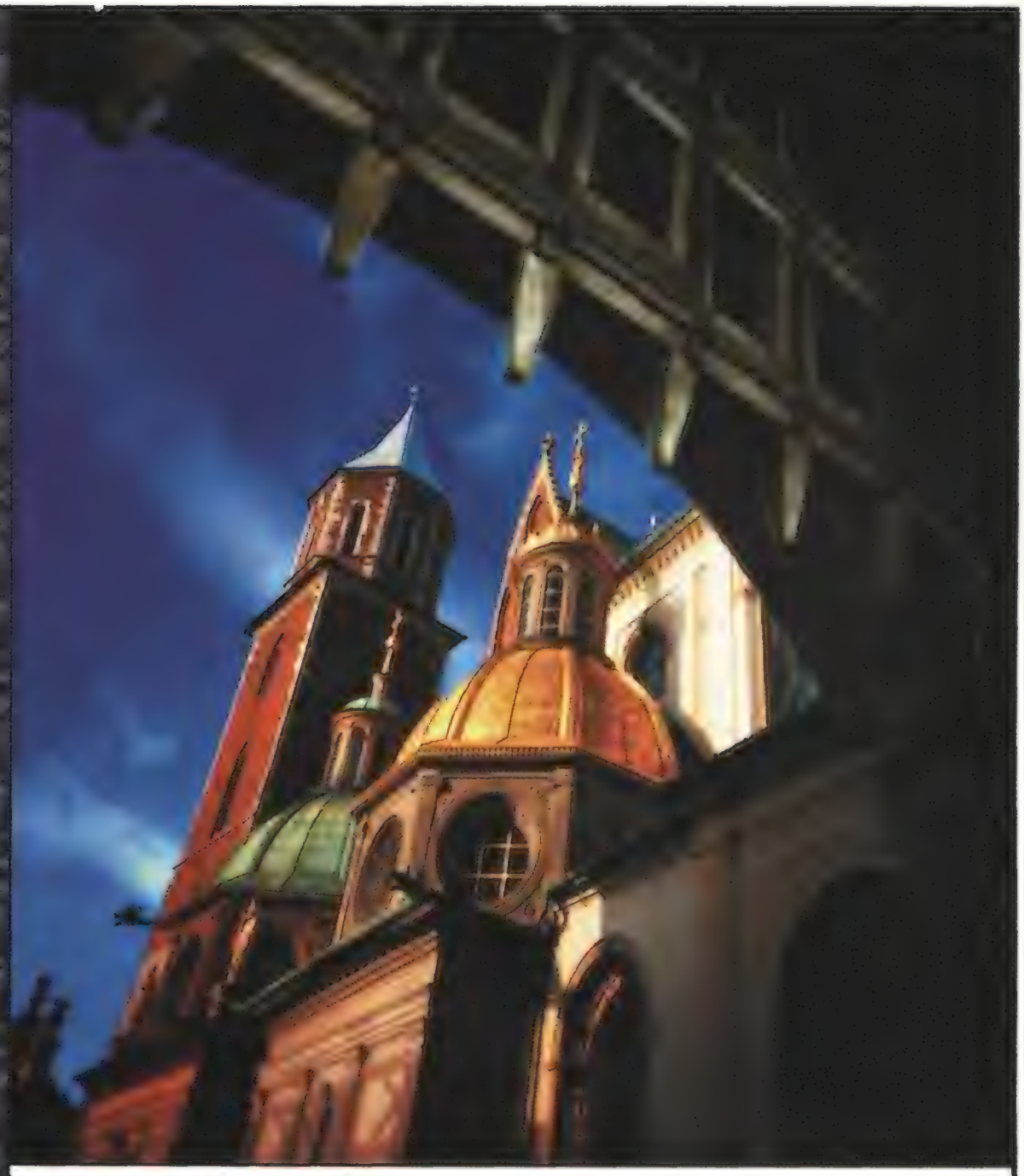

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Gran Cenote is part of the Sac Actun ("white cave") system. Though Carwash Cenote was the first to be explored, new cenotes and systems continue to be found along the coast. By now, I'm convinced that the Yucatán surface is just the limestone wrapper on a large piece of Swiss cheese.

Gran Cenote is a small pond tucked under the ridge of a "collapse," a tropical oasis in the midst of an otherwise barren limestone landscape. I look over the edge and miss the steps that Mayan craftsmen have carved at other cenotes I've seen. The drop, perhaps 30 feet, is too steep for a stone staircase, so they've rigged a series of wooden ladders. I try to look nonchalant as it registers that I will climb to the bottom with 130 pounds on my back. I survive the descent and walk to the edge of the log ramp, then fall ungracefully into the clear water, where Gary and I go through the predive equipment check.

At Dos Ojos Cenote, a commercial group from Cancún gears up for a dive; in only a decade, sport divers have followed close on the fins of the explorers.

Local divers call this cave a "candy store," and once we're in I see what they mean: lots of morsels scattered around in dense formations that look like they've been coated with white frosting, an uneven cake over here, a row of gumdrops along the ceiling, sugarcane sticks everywhere, and those strange wavy sheets growing out of the walls that are called draperies. The formations are denser here than in previous caves, so dense that a couple of times the cave closes into "restrictions," narrow passages with barely enough room for a loaded diver to squeeze through. He might shift the tanks from his back in a configuration called a side mount; on rare occasions, when a passage is extremely narrow, he will take off a tank and push it ahead and hope he's thin enough to follow it through.

Again I lose myself in what the bright circle of my light reveals. About a thousand feet into the cave a dim glow appears to the left. Covering the front of my light, I discern pale green on the surface of the water. We're approaching another cenote, linked to the first by the underground river we are swimming in. A cave system like Sac Actun runs for thousands of feet. Anywhere along that system, the cave can dome up to the point where the land above has collapsed, creating a cenote. We've just traveled from the famous and well-marked Gran Cenote to a smaller hole in the middle of the jungle.

A GAME OF UNDERWATER HOPSCOTCH TO LAY NEW LINE

FARTHER ON, WE ARRIVE AT A MUCH larger cenote, this one flooding the left side of the wall with a wash of soft light. Gary ties his reel to the line and heads for the cenote opening. It's one of the first rules of cave diving—never move without a continuous line between you and the exit.

We surface in the cenote pool, drop our regulators and take off our masks for an "air break." We're on the other side of the coastal highway, surrounded by jungle. It's my first lesson in how exploration works. An explorer starts at a cenote, loaded with extra tanks and scooters (called a DPV, or "dive-propulsion vehicle," the battery-powered scooter can pull you along so you can cover more ground). The diver can push forward about 5,000 feet in a five-hour dive—10,000 feet in and back. The goal is to find another cenote, lay a trail, and then use the new cenote as the starting point. This game of underwater hopscotch, called by some "leapfrogging," helps explorers to keep "laying new line."

After we talk exploration for a while, Gary and I descend, leave the cenote and head back. At the end of the dive I unfasten the reel I left on the way in and start winding us back toward the cave entrance, an illuminated half-moon rimmed with broken teeth. The feet of swimmers and snorkelers twitch on the surface. We've been underwater for 77 minutes, a long time by ocean-diving standards, though our maximum depth was only 43 feet.

As we load our gear back onto the truck, Gary explains how divers get

access to the cenotes. Local Maya were around long before the cave divers and snorkelers arrived in these parts. Many of them live on collectively owned tracts of land called *ejidos*, plots that were taken from wealthy landowners and awarded to communities of indigenous peoples after the Mexican Revolution. Some ejido land is given as a "parcel" for a particular family to work, and some is held by the ejido as a whole. The winds of capitalism produced recent changes in the law, so now the ejido is free to market its natural resources to the outside world. The cenotes are natural resources.

Both Dos Ojos and Nohoch Nah Chich, the two systems in the cave race of the past several years, meander underneath ejido Jacinto Pat, named after a Mayan warrior who fought against the Mexicans in the 19th century. The main entrance of Nohoch lies on the parcel of one person, and he has an exclusive contract with Mike Madden. The main entrance of Dos Ojos is on collective ejido land, and shortly before my arrival the owners refused to grant exclusive access to anybody. Access to the caves, in other words, is complicated and political.

One day I drop in on the admission hut at Dos Ojos, a thatch-roofed *palapa* next to the highway, and chat with two young women collecting visitors' fees. The ejido is in danger, they tell me. The state government is pressuring them to move to a different piece of land. The state has watched the growing revenues, the development of hotels and condos, the increasing numbers of vans loaded with cavern divers and snorkelers on day trips from Cancún and Cozumel. Cenotes are big business.

The natural world, say the young Mayan women, is filled with spirits—*dueños* is the word they use in Spanish, "owners" is the literal translation. The dueños are peaceful, asking only a yearly offering under the supervision of a Mayan priest, who knows how to communicate with them. Only when a human disturbs their peace do they react.

A group prepares to dive at one of the two "eyes" of Dos Ojos, twin cenotes that lead into one of the two largest underwater cave systems.

Wearing side-mounted tanks to give him more clearance in tight spots, Gary Walten carries a reel used to install the nylon line during cave mapping.

Are the dueños upset now, I ask, with all the development under way? The road that runs by the Dos Ojos entrance is being widened to four lanes, and there are plans for an international airport in nearby Tulum. What happens, answers one of them, is that the dueños simply leave when their world disappears. Then the only spirits that remain are the mischievous ones, like X'tabay, "she of the long hair," only now she can do her mischief without the calming effects of the peaceful dueños.

Right now, Gary and Kay are working on a new system that they named Yaxchen, or "blue-green well," located south of Tulum. One evening, Gary shows me the computer-generated map for Yaxchen. It looks pretty straightforward to me. One lays down a line at the beginning and takes it as far as it will go without changing direction. This segment of line is called a "shot." One then determines the length of the line by counting the number of pre-tied knots, placed every ten feet, and estimating the rest, and notes the result on an underwater slate. Next, compass bearing and depth are recorded. What the slate doesn't record are the surprises, the risks, and the shots that don't work.

So far they've laid 450 shots, ranging from 3 to 337 feet in length, for a total of more than 30,000 feet of surveyed cave. Gary taps a button on the computer in the dining room, which serves as the headquarters for their company, Loco Gringo Underground. Actually, their whole house is a dive center, with plastic baskets of dive gear on the floor next to an underwater scooter, a living room with a drafting board covered with maps and aerial photographs, a bookshelf full of reference works on diving and the Maya, and a guest bedroom that must give a visitor nightmares, what with all the hoses, tanks and empty wet suits scattered around.

The computer screen puts the individual shots together and produces a "stick map," a rough picture of the cave system. The early exploration is relatively easy, but as the end of the line moves off into the distance, you either must pay to have a trail hacked through the jungle so that exploration can begin at the most distant cenote, or extend your swimming range—adding more tanks or using a scooter.

When Kay and Gary take me to dive at Yaxchen, I'm surprised by how different it looks from anything I've seen before—a pond in the middle of a mangrove swamp. The water, which picks up tannic acid from the organic material it seeps through, is brown. This cenote, I think to myself, won't make the tourist list. Yaxchen is exploration for love, not for money.

I step off the stone pathway, step through the mud, and jump in. Kay sinks to the bottom, only about 15 feet at this end, and I can barely see her from the surface. I've been spoiled by the crystal-clear waters of the inland cenotes. The plan is to enter the cave, which runs off the other end of the pond, then swim about 1,800 feet to a second cenote.

But it is not to be. As we descend and enter the cave, the visibility drops dramatically. Gary leads, Kay is next, and I'm bringing up the rear to stay out of the way. With Kay a couple of feet in front, I can see only the lower half of her purple wet suit through the murk. Gary's light, when pointed in my direction, glows like a distant car in a London fog.

I figure my job is to stay by the line and keep my light pointed in their general direction. I check the line repeatedly and look at the barren carved rock and the black mounds of silt below. We swim in only a few hundred feet when Gary looms out of the murk and spins two fingers in the air. He's calling off the dive, so I turn and head out. They're thinking what I'm thinking—the situation just isn't right. Kay later says she was worried that I might get some gremlins.

"I LOSE BUOYANCY, SINK, AND KICK UP A SILT HURRICANE"

SHE WAS RIGHT TO WORRY, BECAUSE a novice with gremlins might have panicked and vanished into the murk. But my lesson isn't over yet. After we exit the cave, Gary returns for the reel that connects the open water of the cenote with the beginning of the permanent line. Feeling a bit cocky, I say I'll swim ahead of him and do it.

Visibility is even worse when we reenter the cave; the silt we kicked up earlier still hangs in the water. But I find the line and follow it in. I spot

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A local diver hovers 15 or 20 feet below the sun-drenched opening into Tankah Cenote, which is located only 430 feet from the Yucatán coast.

the reel and come in on a perfect landing pattern. Then I wrap my fin in the line behind me, a common mistake in cave diving. Now, here's where a situation can unravel: while untangling the fin, I kick up some silt. Ah silt, schmilt, who cares? I nose in closer so I can see the reel to unhook it from the line. Unfortunately for me, Gary had wrapped the line around the inside of the hook for security, so I tug and pull and try to figure out why the damn hook won't slide off the line. While I'm figuring that out, I lose buoyancy, sink and kick up a silt hurricane. Now it's just me and a hook I can barely see, but eventually I slide the line off. I don't worry, because I'm near the entrance, but then I realize I can't see it. So I don't worry again, because Gary is nearby, but I can't see him either, because he's hovering behind me, letting the student learn. I start reeling in and have trouble getting the tension on the wing nut right, but finally I pull toward the top of a rock where the line takes a sharp right and leads me into the blue-green gloom of the cenote. I'm so relieved that I don't mind when I surface into a sunken tree.

This dive has proved to be a turning point for me, a shift from clear water and awe-inspiring sights to dark, sharp-edged rock and silt and low visibility. I've just learned how quickly things can deteriorate; the gremlins can come out of nowhere and multiply like cockroaches.

After Yaxchen, Gary figures I can handle some heftier caves. In one, I lead into a room where I stop dead in my tracks as the floor falls away 100 feet into the Cauac Nah, "monster's house," and an ominous mass of dark stalactite glares from the wall.

We finish, load up the truck, then stop at the little restaurant near the cenote, run by the family that owns the land. A Mayan man about my age, in his early 50s, comes out of the kitchen to talk. I speak of the caves, their beauty, the elegant forms, how I've never seen anything like them before. Our eyes lock, blue to brown, beyond differences of history, both of us looking for words in Spanish, our common second language. I tell him, "There was a powerful spirit in Cauac Nah. At least, that's what I felt." For a second I think he looks skeptical, watching me for signs of irreverence. But, to my surprise, his face relaxes and mirrors the awe I felt in the cave.

Then we lose the connection and discuss the merits of the day's special, *caldo de pollo*.

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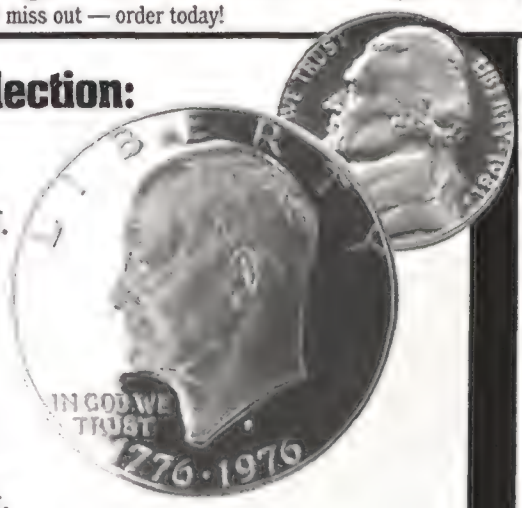

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Two models. Engineered in Germany using the latest scientific technology, the Atomic Clock comes in two styles—the wall clock and the executive desktop model. Both models are designed to be functional *and* easy to use.

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For years, the cause of chronic bad breath has been misdiagnosed, but a dentist's research has led to TheraBreath™, a dramatic treatment system that works naturally and effectively.

These days, people spend a great deal of time on their health and fitness in order to look and feel their best. Unfortunately, many people suffer from a condition that cannot be cured at a health club, spa or even a hospital: chronic bad breath, or halitosis.

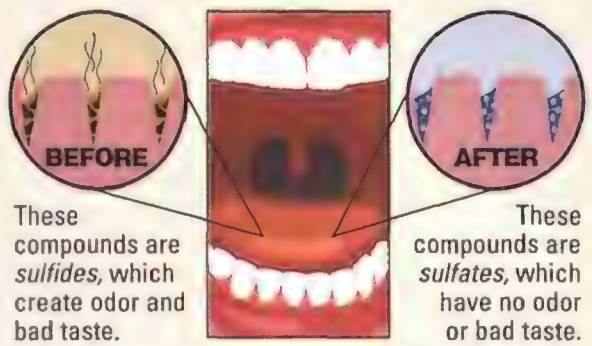
The only solution is the TheraBreath™ system. Because halitosis originates in the mouth, it is virtually undetectable by your own sense of smell. Without proper treatment, chronic bad breath can lead to a loss of confidence and self-esteem, and it can even result in depression. What's needed is a quick and effective treatment that works naturally with no side effects.

A scientific solution. Bad breath does not originate in the digestive system, and the food you eat has no direct effect on your breath. Certain foods, however, contribute to the production of sulfurou gases in the bac of the mouth. Th only effectiv means of elimina ing the sulfur ga production is t introduce oxyge to the bacteri causing them t produce tasteles odorless sulfates.

Effective, saf and natural. A his Californi Breath Clini Dr. Harold Ka has perfected

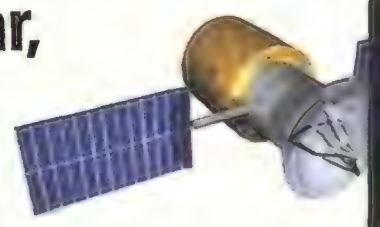
HOW IT WORKS

We all have natural bacteria that live on the back of the tongue and assist us in digestion. Under certain conditions, these bacteria will break down proteins and transform them into sulfides, which create odor and bad taste.


BEFORE
AFTER
These compounds are *sulfides*, which create odor and bad taste.
These compounds are *sulfates*, which have no odor or bad taste.

Oxyd-VIII™ (concentrated pH-balanced ClO2), the active ingredient in TheraBreath, transforms odor-causing sulfides to sulfates, which have no taste or odor.

"My TV reception is so clear, you'd think I had a 50-foot antenna on my roof!"



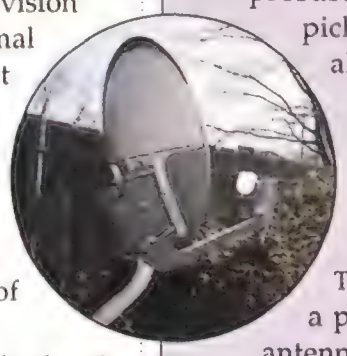
Emerson's new antennas are hard to spot, easy to install and provide clear, powerful reception of broadcast signals...without rabbit ears.

Your neighbors won't know it's there unless you tell them.

I'm amazed at the way technology has improved television. Unfortunately, a television's picture is only as good as the broadcast it's receiving. Rabbit-ear antennas don't improve your picture to any great degree, and most roof antennas are large and not pleasing to the eye.

Stealth antenna. In the past, creating a television antenna with optimal reception meant making it big, with a large amount of surface area. This resulted in products that were either large and unsightly or small and ineffective. Either way, the aesthetic look of your room or house suffered.

Recently, a scientist in Colorado developed an antenna that would maximize reception without being overly conspicuous.



Emerson, a leader in electronic technolog has now made this innovation available the public. First, they created a flexible ci cuit board with a serpentine antenna, resu ing in a large surface area confined to a ve small space. Second, they developed a tec nique that converts the copper shielding

Attention mini-dish owners. If you own a mini-dish satellite system, you are aware of the off-air issue and are probably wondering how you can pick up local broadcasts. After all, what good are hundreds of channels if you can't find out who won the local city council race? The Dish-mate™ harnesses the same innovations as the Optima TV antenna to give you a powerful omnidirectional antenna that is virtually invisible. It is compatible with a variety of systems and is easy to install.

ve-step program for treating halitosis. By sing these products regularly, chronic alitosis sufferers can end their problem. heraBreath eliminates sour taste in the outh, improves general periodontal ealth and will even whiten teeth. Thera-reath's mild spearmint flavor tastes great nd creates pleasant, neutral breath. These roducts are all-natural and simply intro-uce a greater amount of oxygen into the outh's chemistry.

ry it risk-free. TheraBreath is an effective, afe and easy-to-use solution to a troubling roblem, but don't just take our word for it. ry it for yourself with our risk-free home ial. If you're not satisfied, return the nused portion within 30 days for a full, No Questions Asked" refund. ■

e attached able to an dditional i g n a l eceiver, h i c h esults in an n t e n n a lmost 10 eet long. his greatly enhances the antenna's recep-on power and allows you to tune the ntenna by simply moving the cable! Plus, e omnidirectional design allows you to ount the unit anywhere. The Optima's niversal design makes it adaptable to any mponent, and installation is a snap.

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One scientist's vision revolutionizes the hearing industry, benefiting millions of people...

Crystal Ear® uses sophisticated electronics to provide affordable, cosmetically-pleasing and easy-to-use hearing amplification.

One day a friend asked my wife Jill if I had a hearing aid. "He certainly does," replied Jill, "Me!" After hearing about a remarkable new product, Jill asked me if I'd ever thought about getting a hearing aid. "No way," I said. "It would make me look 20 years older and cost a fortune." "No, no," she replied. "This is entirely different. It's not a hearing aid...it's Crystal Ear!"

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It is smaller than the tip of my little finger and it's almost invisible when worn. Put it in your ear and its ready-to-wear mold fits comfortably. Since it's not too loud or too tight, you may forget you're wearing it!

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—A satisfied Crystal Ear user

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Don't be fooled by high prices. No hearing device, no matter how expensive, can eliminate background noise, despite claims by the manufacturers. Crystal Ear does not promise miracles—just an affordable, sound solution to many common hearing problems.

Try it risk-free. Crystal Ear comes with a 90-day manufacturer's limited warranty as well as Comtrad's exclusive risk-free home trial. Try it, and if you're not completely satisfied, return your purchase within 30 days for a full, "No Questions Asked" refund. ■

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For Whom The Bell Tolled

IN THE SPANISH CIVIL WAR, AS A HORRIFIED WORLD WATCHED, THE FUTURE OF EUROPE SEEMED AT STAKE ◆ BY ROBERT WERNICK

THE ROADS ARE EMPTY LEADING TO BRUNETE IN summertime: no one wants to drive 15 miles from Madrid to visit a sleepy little town baking among brown fields under the merciless sun of the Castilian plateau. There are no tour guides, no flags, no souvenir shops, no postcards, no monuments, nothing but a few stone bunkers, a couple of tarnished bronze plaques and a street named after Generalissimo Francisco Franco to remind the visitor that in July of 1937, sixty-one summers ago, more than a hundred thousand men were fighting here in a battle that passionate bystanders all over the world believed might decide the future of Europe.

Though no one realized it at the time, Brunete

The image of a Republican soldier at the moment he was hit, fixed in memory by photographer Robert Capa, still symbolizes the war.

Republican troops move up, and stretcher bearers are busy, in the battle for Brunete just west of Madrid, in July 1937. The tanks are Russian; the wagon is a 1937 Ford.

was the Gettysburg, the climax and turning point, of the Spanish Civil War, which had begun a year earlier with a rising by army generals to overthrow the government of the Second Spanish Republic and would last almost two more years after Brunete. When it was over, an estimated half-million Spaniards had been killed.

IT WAS THE FIRST WAR IN HISTORY that could be followed almost minute by minute by a horrified world—in beleaguered Madrid, reporters could take a taxi or the subway to the front lines at the edge of the city, and their stories would be in the papers everywhere the next day. What they saw was a particularly brutal war that cut to the heart of almost every city and village in Spain. Each day brought its share of atrocities. Some of them were new to warfare, like the mass bombing of helpless civilians in cities, but to the watching world they all served as a reminder that what it feared most, the outbreak of another and much greater war, might not be avoidable. That war began in September 1939, only months after the Spanish conflict ended. After presiding over a victory parade among cheering crowds in Madrid, General Franco ruled as dictator of Spain for the next 36 years.

The people of Spain were divided almost exactly in half with regard to broad political loyalties. But in most every other way—religion, region, ideology, standard of living—they were hopelessly fragmented. In the election of February 1936, the last free vote Spain was to know for nearly half a century, a Popular Front of liberal and extreme left-wing parties, some dedicated to revolution now, nudged out the conservatives of the Right by less than two percentage points. The electoral laws allowed this uneasy coalition to form a sizable majority in parliament, but the new government it formed was too splintered to rule effectively, and could only watch helplessly while the country—which had already seen five years of riots, general strikes, church burnings, a failed putsch by army officers and an armed rebellion by miners—slipped further toward chaos. There would soon be a new common word in the vocabulary of everyday life, *paseo*, meaning "ride," as in the phrase "take him for a ride" made popular by Hollywood gangster movies. It was just such a ride—one on which the monarchist party leader Calvo Sotelo was taken to be murdered in the early hours of July 13, 1936—that set off the armed uprising hardly a week later.

Both the Left and the Right in Spain had moderates and centrists who hoped for compromise. But by the time the guns began to play on July 18, extremists ran the show. For the defenders of the government, who called themselves Republicans or Loyalists, all their enemies were Fascists. For the supporters of the insurgent generals, who called themselves Nationalists, all their enemies were Reds. Men who were ready to die to protect Catholic Spain now assumed a license to kill anyone, schoolteacher or government official or working man in blue overalls, whom they suspected of having voted for the Popular Front. Men who were ready to die for an imagined future Spain in which—as the two-million-member anarchist workers' union demanded—the state, the army, the church and private property would be abolished all at once, were now ready to kill any oppressor of humanity, landlord or employer or priest or anyone who owned a car or an expensive-looking

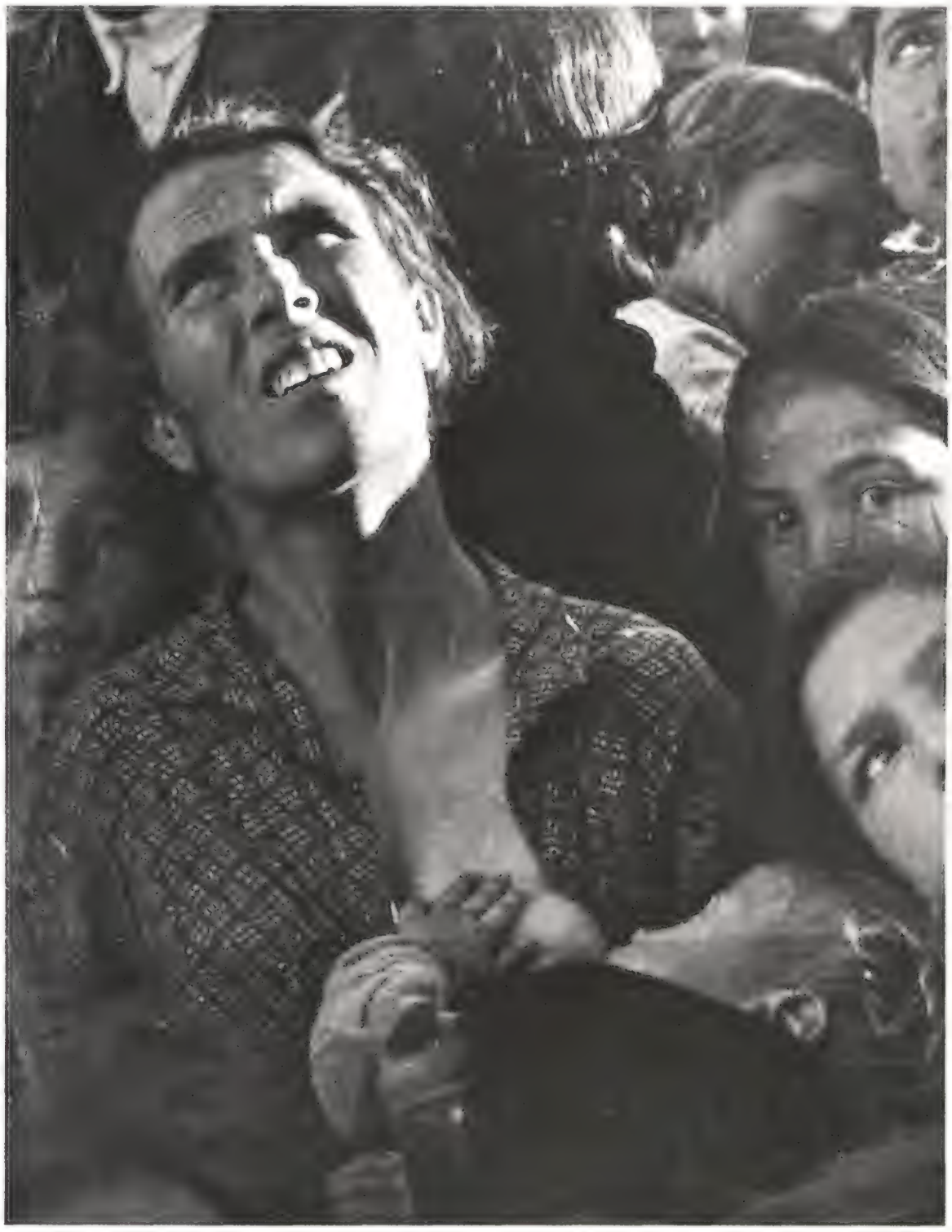
house. Armed gangs on both sides roamed the country, shooting, stabbing, strangling, while firing squads worked overtime in prison courtyards. The bodies would be left for days in the streets as a warning.

The killing could be done as a matter of routine, or it could be the occasion for a public spectacle like the fictional one described in Hemingway's *For Whom the Bell Tolls,* in which local peasants hauled out of bed the prosperous citizens of a town, along with its priest, and variously beat them to death or threw them over a cliff. General Franco was once asked what should be done with women taken prisoner while carrying rifles. In his usual calm matter-of-fact tone he replied, "Shoot them," and continued eating his lunch. Then he went back to the business of signing edicts—like the one forbidding males above the age of 2 to appear bare-breasted on Spanish beaches. The French writer Simone Weil, who in 1936 went to Barcelona to see the people's revolution taking place there, was horrified when anarchists told her how they had captured two priests. "With a revolver they killed one of them on the spot, right in front of the other one, then told that one he could go. When he had gone twenty paces they shot him down. The person who told me this story was quite astonished not to see me laugh."

The original rising was badly executed. Three of the top Nationalist generals who had planned the coup died or were taken prisoner within 48 hours. When officers of the Mediterranean fleet joined the rebellion, their crews mutinied and, in some cases, shot the officers and dumped their bodies into the sea.

A particularly brutal war, it cut to the heart of almost every city and village in Spain.

At the beginning a part of the army and the air force stayed loyal to the government, which still loosely controlled more than half the national territory, the principal ports, and most of the country's industry and mineral resources—not to mention its gold reserves. The military insurgents had only two major advantages, but they turned out to be decisive. One was political: the fact that the elected government so clearly could not keep its revolutionary left wing under control. One was military: in Spain's strip of the North African coast, General Francisco Franco had taken command of the local garrison of Moroccan troops and the Spanish Foreign Legion. As armies go, it was small—no more than 25,000 men at the start—but it was the only efficient fighting force in the country. In a few weeks, in the first major troop airlift ever, Franco began to bring his forces over



Facing death from the sky, a woman nurses her baby as Franco's planes drop their bombs on civilians in Barcelona.

Volunteers from all over the world, including some 2,800 Americans, joined the International Brigades.

the sea to the Spanish mainland, many in German planes.

Troops and officers in a number of cities rallied to the rebellion. In the north an insurgent army, led by Gen. Emilio Mola, drove to the coast, cutting off the Basque provinces from the French border. In the south, starting from Seville, Franco's army pushed north to Madrid, outmaneuvering and slaughtering undisciplined and poorly armed worker and peasant militias that tried to stop them. In November, when Franco's troops approached Madrid, the Republican government commandeered all available trucks and fled in panic to set up shop in Valencia on the Mediterranean coast. But the people of the city rallied to build barricades, and the advance bogged down in costly fighting in the southwestern suburbs.

In the following months, the scattered, uncoordinated forces of the early days grew into more or less well disciplined, more or less well equipped armies, eventually approaching half a million men each, and things settled down into the pattern of conventional war. As the Battle of Brunete was about to begin, these armies were stalemated along a front that snaked its way 1,000 miles across the country from just north of Gibraltar to the Pyrenees.

An impoverished, predominantly agrarian society like the Spain of the 1930s could not possibly have maintained a war on this scale. But the war—though the armies that fought it were made up overwhelmingly of illiterate boys from the desolate countryside and villages of Spain—soon became international.

The totalitarian powers were delighted to be able to push their political and strategic agendas. Hitler thought the conflict a "convenient side-show" that would distract the attention of the Western democracies from the much bigger war he was preparing. Stalin hoped that Hitler would get bogged down in Spain and have to postpone any adventures to the east. Hitler sent 600 planes, aviators, 200 tanks, military experts and 17,000 men. Mussolini sent planes, tanks and at least 75,000 so-called volunteers. Stalin sent planes, guns, tanks and military "advisers," no fewer than four of whom went on to become marshals in the Red Army, which would crush the German Army only a few years later.

On both sides aid was doled out carefully, and never as a gift. Stalin got much of the gold reserves of the Bank of Spain, 158 truckloads of it, some in direct payment for matériel, some for "safekeeping" in Moscow. Hitler got much of the output of the Spanish copper, iron and tungsten mines to provide steel for the Wehrmacht. Mussolini got a naval base on Majorca and a chance to demonstrate Italy's "iron military strength."

FOR THE WESTERN DEMOCRACIES, the choice was more difficult. While public opinion, partly driven by intense and skillful Communist propaganda, might favor the Republican government of Spain, public and governments alike were haunted by memories of the Great War, which only two decades before had killed or maimed millions of their young men. To a considerable extent pacifist, and militarily unprepared, they were desperately anxious to avoid another one. The United States had just passed a neutrality act. The British got all the great powers of Europe to sign a nonintervention pact, which Germany and Italy promptly broke.

In all the democracies, however, there was a large minority, passionately concerned and loudly vocal, who would have nothing to do with neutrality or nonintervention, and who insisted the overriding question for the world was the sudden and terrifying rise of Nazi barbarism. Nobody had dared to stand up to Hitler so far, and now behind their improvised barricades the people of Spain, bombed by Nazi planes and assaulted by Nazi tanks, were stoically accepting shells and bombs, and hunger, shouting, *No pasarán!* They shall not pass! It was all summed up

What to do when a whale calls 911.

In January 1997, a baby gray whale was found struggling along the California coast. Separated from her mother at birth, she was weak, dehydrated and barely clinging to life. Her only chance for survival was Sea World. Thanks to an around the clock team of dedicated marine mammal specialists and veterinarians, thousands of gallons of clams, fish and cream, and her very own 1.7-million-gallon pool, this big baby named J.J. is still making history. Now a robust 20,000 pounds, J.J. is ready to face her next challenge. If all goes well, her successful return to the ocean will begin a new chapter in a very special story.

J.J.'s amazing rescue touched millions of people around the world. But most of our rescues don't make headlines. They happen behind the scenes every day of the year. Dedication isn't a new idea at Sea World. Our 40-year commitment to conservation and environmental awareness continues to grow stronger every day. Just like J.J.

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North of Madrid, in the early stages of the war, Nationalist troops round up captured Republican militiamen at Somosierra Pass in the Guadarrama Mountains.

in the famous Robert Capa photograph (pp. 110-111) of a Republican militiaman, dressed in working clothes and without a helmet, holding an old-fashioned gun as he is shot dead on a barren field in Andalusia.

To writers, artists, students, intellectuals, as well as to unemployed workers living out the Great Depression, Spain became a rallying cry. Picasso made a world-famous painting deploring war and the Nationalist bombing of Guernica. Hemingway wrote a world-famous novel, expressing support of the Spanish people. Huge meetings from London to Los Angeles thundered with demands for lifting the embargo and shipping arms to Republican Spain.

Others felt that only direct physical action, here and now, could stop the terrifying onrush of the brown tide of Fascism. André Malraux, the French novelist, recruited a squadron of airplanes. English idealists like George Orwell joined workers' militias that believed revolutionary actions like redistributing land and setting fire to churches were more important than learning how to fire a gun. On the more realistic premise that the first order of business was not revolution but winning the war, some 35,000 volunteers from almost every country in the world, including 2,800 Americans, joined the International Brigades.

The Brigades were formed and directed by Communists, many of whom were old party stalwarts—like

Josip Broz, later to be Marshal Tito, ruler of Yugoslavia. But others were idealistic young people to whom Soviet Russia, which claimed to have solved all social and economic problems, was a beacon of light pointing to a utopian future. Most joined the Brigades for the same reason that ordinary Spaniards began joining the Spanish Communist Party, which grew from 130,000 to nearly 400,000 members in one year: the Comintern (Communist International) had prudently abandoned its call for world revolution in favor of a united front against Fascism, and even those who distrusted it figured it was the only group disciplined and ruthless enough to run a war against Franco.

In July 1937 a large number of the Brigades—including some 900 Americans—were picked to be in the front line for the Battle of Brunete, the first major offensive to be mounted by the Republican Army. They had been trucked by night into the woods of a former royal hunting lodge west of Madrid. After a Fourth of July celebration that brought the Americans double rations of Hershey bars and Lucky Strikes, they were on the march, picking their way through the pinewoods, elated to be in the forefront of an 80,000-man force, the most powerful army that had ever gone into battle in the whole history of Spain, with some 130 tanks, 40 other armored vehicles, 300 planes, and 220 heavy guns. They were singing the "Internationale": "Arise ye prisoners of starvation. . . . A new world's in birth. . . ."

As dawn came up on July 6, and all the guns, planes and tanks went into action, the Americans could see the whole battlefield spread out before them: gently rolling countryside with a few villages and clumps of trees, a few narrow streams, no serious physical obstacle between them and Brunete, 15 miles to the south.

In a vignette of war, a soldier father holds up his son for a good-bye hug.

Their battle plan was described by Colonel Rojo, who drew it up, as possessing a "rigorous technical beauty, almost perfect." A giant pincer was to close on the insurgent army dug in at the doorstep of Madrid.

Franco had sent his best troops and many of his German planes 200 miles to the north to capture the major port of Bilbao, near the Bay of Biscay. The army he left behind at Madrid was badly outnumbered. Russian planes controlled the air, and the ten-ton Russian tanks could brush off their three-ton Italian counterparts like so many flies.

FRANCO'S SPIES MUST HAVE picked up mountains of talk about the coming offensive in the noisy sidewalk cafés of Madrid, but when the blow struck on July 6, the Nationalists were not ready for it. The left pincer stroke ran into heavily fortified positions and could make no headway at all. But the right-hand stroke succeeded beyond its leaders' wildest hopes. Ahead they saw the enemy in disorderly retreat. The Nationalist front disintegrated within hours, and Republican troops sped forward under a bright cloudless sky, their only worry the 100-degree heat, which emptied all their canteens by 10 in the morning.

The enemy was so disorganized and demoralized that an entire division—commanded by Enrique Lister, the Communist quarrier who had risen from the ranks to become one of the Republicans' most successful and most charismatic generals—was able to slip unobserved all the way to Brunete and beyond, leaving one battalion to capture the town far ahead of schedule. They had punched a wide-open hole in the enemy line through which tanks and cavalry and foot soldiers could have poured to spread havoc in the enemy rear and deliver a decisive blow, as the Germans would do to the French Army at Sedan just three years later.

Then almost everything went wrong. On top of the usual muddle of battle, many of the officers who ran the Republican forces were not up to their job. They may have been able to inspire men to hold a position to the death, but they had no experience of a war of maneuver. According to one Republican colonel, most militia leaders did not even know how to read a military map. They had no way of handling the immense traffic jams of troops, trucks and ambulances that turned their breakthrough into a bottleneck.

A combination of tradition and inexperience in the Soviet and Republican armies dictated that all decisions be referred to headquarters, and by the time approval came it was too late. They were cautious when they should have been bold, reckless when they should have been cautious. The American troops, who might have been pouring through the hole in the enemy lines on the first day of the battle, were ordered instead to make a frontal attack on the village of Villanueva de la Cañada, where a small force of Nationalists had dug in for a last-ditch stand. They took the village

General Franco (hatless, with mustache) poses with captured enemy rifles. Right: A Republican poster shows Franco's side as a mix of Fascist generals, Nazi capitalists, Moroccans and princes of the church.

but suffered crippling casualties, and wasted 15 hours that could never be made up.

On the other side, in the crucial hours following the fall of Brunete, three Nationalist lieutenant colonels, cut off from communication with their superiors, handled their few troops with such skill and made such an artful commotion that they bluffed overwhelmingly superior attacking troops to stop and wait for reinforcements. At least one managed on his own initiative to scrape together some 300 men—clerks, drivers, men who had barely handled a rifle before—and set them to work digging trenches.

Then, in a remarkable display of speed and efficiency, reinforcements were hurried to Brunete from all over Nationalist Spain, traveling great distances over the same kind of rickety

railways and wretched roads as those of the other side, but these arrived in time. By the third day the Republican advance had ground to a halt, and men who had left shovels and other equipment behind so that they could advance faster were forced to dig trenches with bayonets and helmets in the stony Castilian soil.

The mastery of the air provided at first by Russian planes frittered away with the arrival of new German equipment, like the Messerschmitt 109 fighter plane and the 88-millimeter antiaircraft gun, which would later do such deadly work in World War II. What was to have been a battle of maneuver turned into a small-scale replica of World War I battlefields like Ypres and Verdun. Masses of troops surged back and forth over a devastated countryside of burning fields and trees, burning tanks and screaming men, and the rattle of machine guns, trying to chase each other out of holes in the ground. It went on for 21 days. The scorching sun turned dead bodies to mummies and dried up all the watercourses on the battlefield. Men actually went mad from thirst. Six decades later the surviving veterans of the battle are obsessed with memories of the experience.

HARRY FISHER, A VETERAN OF the Abraham Lincoln Brigade, who was in action all 21 days, can never forget the frantic hour-long minutes he spent digging with a soupspoon down into the hard-baked bed of the Guadarrama River, down to where there were little pockets of mud, out of which he could squeeze a few drops of water.

When it was all over, and more than 40,000 casualties had been added up, each side claimed victory—the Nationalists because they had retaken Brunete in the last days of the battle, the Republicans because they had conquered and held on to about 20 square miles of devastated Spanish soil. In the long run, it was a disaster for the Republican Army, which lost 100 airplanes and 80 percent of its tanks and more than 20,000 soldiers. (Of the 900 Americans who started the battle, only 280 were fit for action at the end.)

The war would go on for almost

two years, but it was largely a replay of Brunete. At Belchite, at Teruel, even on the Ebro, the Republicans made a surprise attack and advanced for a few heady days to occupy pockets of often strategically unimportant terrain, only to be ground down yard by yard in long bloody counterattacks till at last their armies collapsed, and eventually Francisco Franco became dictator of Spain.

The German generals who were advising Franco were critical of his strategy. They said that if he had just let the Republican attacks peter out, and not insisted on costly counterattacks, he could have won the war much more quickly and with fewer losses. They were probably right, but they were shortly to end up in the dustbin of history, while General Franco made the remarkable and almost unbelievable achievement of not only winning his war but managing to remain the master of Spain for 36 years.

No one at the start of the war, least of all his fellow generals, could have suspected that such a role could be played by Francisco Franco y Bahamonde. Though he had proved himself a genuine war hero of the Moroccan campaigns and a capable military administrator, he was a colorless little man with a piping voice, no oratorical skills, no political sex appeal.

Franco won the war not because his army was stronger or braver than that of his enemies, but because it was better organized, more professional, more at home in the complexities of modern warfare. He turned out to be the very man to create and lead such an army. He was a fierce disciplinarian with an obsessive concern for detail. He once had a soldier shot for refusing to eat his rations. He was responsible for building the network of training schools for young Nationalist soldiers who became the *alféreces provisionales*, or temporary officers, whose willingness to take individual initiatives without waiting for orders from headquarters helped determine the outcome of the war. With immense skill he wrangled, cajoled and bullied all the antagonistic groups in his camp to form a single movement with himself as its unchallenged political and military boss.

Among the many artists and writers who dealt with the war were Ernest Hemingway (above, left), Pablo Picasso (left, with his painting *Guernica*) and George Orwell, who fought as a private in Catalonia.

The Republicans, on the other hand, never achieved real unity of command. They were torn by conflicts between different parties, different regions. There was civil war in the streets among Communists, Socialists and anarchists. Anti-Stalinist and anarchist worker militias believed they should be fighting not just for a

republic but for a revolution as well—particularly in Catalonia. In *Homage to Catalonia*, George Orwell, who sympathized with these policies at the time, described how they "collectivized" factories and farms, theaters, even restaurants, often at gunpoint; established local police forces; and replaced the local government. In militia companies everyone wore the same uniform—overalls. It was considered demeaning to waiters to offer them a tip.

There as elsewhere, the church was a target, which troubled moderate loyalists. Some 7,000 priests, monks, nuns and bishops were put to death during the war. Throughout Republican Spain, churches were regularly burned, sacked or pressed into revolutionary service.

All through the fighting, Spanish officers in the Republican Army continually bickered among themselves and grumbled about the high-handed ways of their Soviet advisers. Franco, meanwhile, kept all the reins firmly in his hands. He would take advice but never orders from his German and Italian advisers.

AFTER THE WAR, TOO, HE PICKED a surefooted way through the dangerous thickets of national and international politics. When in 1943 he realized that he had been betting on the wrong horse by shipping vital minerals to Hitler, he coolly began selling them to the Allies. In 1959 he switched from the state-controlled economy that had been his pride to a free-market policy that has made Spain a prosperous nation for the first time since the 16th century. While he lived, he found lackey biographers to portray him as the greatest strategist, statesman, political philosopher and moral leader of all time. Since his death, biographers have tended to be both hostile and scornful, emphasizing his cruelty, his narrowness, his deviousness, his occasional stupidity. Some prefer to ascribe many of his successes to his *retranca*, the stereotyped cunning of peasants of Galicia, his native province. Few Galician peasants, however, have come close to equaling his performance.

For the fact remains that when death ended Franco's long reign of absolute power in 1975, Spain was a richer, more stable, more peaceful and more united nation than it had been when he took up arms in 1936. Though he gave Spain its first social security and other features of the welfare state, and though he unwittingly started the process that would allow his dictatorship to become a democracy after his death, he never gave up his conviction that it was his God-given duty to crush everything that he regarded as "anti-Spain." By war's end, some 500,000 Spaniards had gone into exile. Thousands were tried and jailed or executed. One of his last actions as head of state was to spurn a request that widows of Republican soldiers be given pensions.

The Spanish people, on the other hand, had somehow decided on their own, without advice from Franco or any other political leader, to bury the past, as if they had taken for their own James Joyce's view that history is a "nightmare from which I am trying to awake." *Nunca más!* (Never again!) became the watchword. Barely a generation after three years of atrocious fratricide, they had decided that they had to, and would and could, live together in peace.

Nightmare or no, history has a curious way of playing tricks on people. The Spain of today—with its parliamentary democracy, free speech, free markets, its material prosperity and its rampant consumerism, where *futbol* now equals the slaughter of bulls as a national spectator sport—is exactly the kind of society that both Franco and many of his revolutionary adversaries in the civil war would have regarded as an abomination, and a cesspool of bourgeois decadence.

At Brunete, which is at least twice as large, in size and population, as it was in 1937, it is hard to see the new buildings for the billboards announc-

In the last months of the war, hundreds of thousands of Republican refugees poured over the Pyrenees into France, leaving their weapons with French authorities.

ing the construction of chalets, apartments and duplexes, for yuppies of the bustling, prosperous new Madrid—where the word *paseo* is only heard in old movies.

Twenty miles up in the mountains a giant crucifix towers over the Valley of the Fallen, a monument built to be an everlasting memorial to the dead soldiers of the civil war and especially to the victorious leader, Francisco Franco. It is now one of the great tourist attractions of the Madrid area. People whose grandparents may have been murdering each other 60 years ago drive up to it by the hundreds every day in their new cars and walk down the arched nave, which plunges like a celestial railway tunnel 500 feet through solid rock to where the generalissimo lies buried. On their way out they may stop to buy memorial T-shirts or a cookbook from a nearby religious order before they drive back to the traffic-choked streets of Madrid for a meal at McDonald's and a quick check of the latest stock market quotations.

Free after years of an obscurantist dictatorship, people now snatch up books exposing the follies and corruptions of the Franco reign, and they cheer when survivors of the Abraham Lincoln Brigade come back to their battlefields and are made honorary citizens of Spain. But there is no sign of the old passion, the old intransigence. "I was so happy the day Franco died," said a lady at dinner the other night in Madrid. "School was closed that day."

Frequent contributor Robert Wernick last wrote on the library that replaced the Reading Room of the British Museum.

Daughter *of the* DESERT

BY JANET WALLACH

RENOWNED AS THE UNCROWNED QUEEN OF IRAQ, GERTRUDE BELL WAS ONCE THE MOST POWERFUL WOMAN IN THE BRITISH EMPIRE

IN THE WINTER OF 1914, AFter a six-month journey across the Arabian Desert, a tall, redheaded Englishwoman led her caravan of camels, mules and men into the sprawling camp of the Anazeh tribe. Dismounting without hesitation, she marched directly toward the tent of the paramount chief. A ruthless and brutal warrior in his youth, Fahad Bey was now over 70. With a falcon peering over his shoulder and a greyhound by his side, the formidable sheik welcomed the daring voyager and ordered his men to spread fine carpets on the ground. As the Arab and the Englishwoman sipped coffee, she told him of her recent adventures in the desert—how she had been taken prisoner in Arabia, defied Bedouin bandits, and watched as her men slit the throat of an ailing camel, saving it from a slow and agonizing death. Filling him in on the latest events in Constantinople, she spoke with the authority of one who understood politics and power. But she also knew the rule of the desert—

Bell (in hat and furs) is flanked by Winston Churchill, on her right, and T. E. Lawrence at Giza during the 1921 Cairo Conference.

Unmistakable in her long skirt and sun hood, Bell records measurements of the massive ruins of the sixth-century castle known as Ukhaidir.

everyone is an enemy until you know him to be a friend. The sheik, who bore the mark of an enemy's lance from his back through his chest, looked upon her with suspicion.

"Tell me the truth," he implored. Why did the intrepid Englishwoman who had made a reputation for herself as an adventurer and a writer want so much to travel? Was it for commerce? No, she answered, it was for knowledge. But it was dangerous and toilsome, he argued. She repeated that the travel was not for profit. The English simply did not like to sit at home; they much preferred to see the world. "*Sadaq*," she said in Arabic. "Believe me." "*Sadaq*," he replied. "I believe you."

Some years later, the sheik would tell his followers about the British woman Gertrude Bell. "My brothers," he declared, "she is only a woman, but she is a mighty and valiant one. . . . If the women of the English are like her, the men must be like lions in strength and valor."

In the days when empires spanned the world and there were no Arab nation states, when Syria, Lebanon, Jordan, Iraq and Israel (then outposts of the Ottoman Empire) did not exist, Gertrude Bell was a creator at the creation, drawing the lines in the sand, determining rulers, distributing oil rights.

Whether in London, Cairo, Baghdad or the desert, this brilliant and bold Victorian was forever at the center of a circle of men—rich men, powerful men, diplomats, sheiks, lovers and mentors. She was a counselor to kings and prime ministers; a colleague of Winston Churchill and Lloyd George; a crony of T. E. Lawrence and St. John Philby; and an intimate of Arab chiefs. "Mesopotamia's Uncrowned Queen," the New York *Herald* called her, putting her picture at the top of the page. Indeed, for several years after World War I, Bell was the most powerful woman in the British Empire. Yet, less than 80 years later her name is hardly known.

Born in 1868 into the privileged world of one of England's most prominent industrialists (family friends included such luminaries as Henry James and John Singer Sargent), Gertrude Bell was expected to become a well-educated, well-mannered Victorian lady. A true daughter of the empire, she was devoted to her father and always obeyed his wishes. But unlike other women in her class, Bell had ambitions that would go far beyond the home. Her world would be in the East, in Syria, Arabia, Egypt, and most of all, in Iraq, where she would make her mark on history.

One of the first women to study at Oxford, she earned the university's highest honor in Modern History. But her audacity shocked her professors when, at her oral examinations, she openly challenged some of their premises. Her brash opinions hindered her quest for a husband as well. At age 20, Bell was packed off to Bucharest, where it was hoped her aunt and uncle (the British ambassador to Romania) would transform her from a snobbish intellectual into a polished ingenue. Instead, she appalled her aunt by telling a distinguished French statesman in front of a group of diplomats that he had no understanding whatsoever of the German people. Although her stay in Bucharest failed to produce a husband, Bell did meet Valentine Chirol, a well-connected foreign correspondent for the *Times* of London, who, over the years, would become her confidante and counselor. Most important, though, the experience kindled in her a lifelong passion for travel. "Few such moments of exhilaration can come as that which stands at the threshold of wild travel," she would later write.

In Switzerland she tested her mettle against the icy heights, climbing unexplored peaks and earning her place on a mountain in the Swiss Alps that still bears her name. On one climb, Bell and her guides were trapped by an avalanche and a raging thunderstorm. "Suddenly [the rock we were standing on] gave a crack and a blue flame sat on it for a second," Bell recalled. "My ice axe jumped in my hand and I thought the steel felt hot through my woollen glove." With no way to continue in the dark and no place to take shelter from the storm, they were completely vulnerable. Linked together on a rope, they somehow managed to squeeze into a tiny crack between the rocks, where they huddled for 16 hours. As they attempted to make their way down the next day, they were met by blinding snow. Nightfall found them still on the icy peak. Though Bell was convinced "it was on the cards we should not get down alive," she maintained her composure and focus. When the weather cleared the next morning, the group was finally able to descend. One of her guides would later say that of all the amateur climbers he had known—men and women—no one had equaled her "in coolness, bravery and judgment."

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Her taste for adventure also took her farther east. In Persia she fell in love with Henry Cadogan, a handsome, albeit poor, young diplomat: "very thin, agreeable, intelligent, a great tennis player. . . . I like him immensely." He rode with her across the desert, led her to the Zoroastrians' Tower of Silence, and took her on picnics, where they lay on the grass, reciting poetry. When her father refused to let them marry, pointing out the fellow's gambling habits and inability to maintain her in high style, Bell returned to England hoping to change his mind. "Some people live all their lives and never have this wonderful thing," she told her mother; "at least I have known it and have seen life's possibilities. . . ."

To fill her days, she began writing a book about her experiences in Persia. Several months later, as she read over a chapter describing the scourge of a cholera epidemic, she received a telegram from Tehran. Excitement quickly turned to despair as she read its contents. Cadogan had plunged into a river's icy waters outside Tehran while trout fishing, fallen ill with pneumonia and died. "Songs of dead laughter, songs of love once hot. . . . Songs of a rose whose beauty is forgot," she wrote later, interpreting the words of the Persian poet Hafez. Her volume of translations is still cited by many as the finest ever done.

Travel became her consolation. She visited France, Italy and Germany. Later she journeyed to Jerusalem,

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Pictures of an expedition: photographs taken by Bell document her 1914 journey to northern Arabia. In Jordan, she sought protection in the camp of Sheik Harb (opposite). Later her caravan prepares to leave Hayil (left) as tribesmen outside the walled city brandish weapons.

studied Arabic, explored Baghdad and Damascus, and rode sidesaddle across the Arabian Desert, venturing where few Westerners had ever dared go. She shouted war songs with members of the secretive Druze sect and traveled through the lands of the devil-worshiping Yazidis. The Arabs pronounced her a "daughter of the desert" and made her an "honorary man."

In 1909 she set out across the desert to Mesopotamia. Her trunks packed with pistols, her saddlebags crammed with books, she was accompanied by an entourage of male servants, baggage animals, horses and a plethora of equipment—cameras, tents, a folding bed and a canvas bath, mosquito netting, rugs, provisions for a month, quinine, camphor, cigarettes, and an entire set of Wedgwood china, crystal and silver for proper dining.

Heading southeast toward Baghdad—a distance of 500 miles—she rode across land so dry that the oases offered the animals only caked earth. Seeking refuge in the tents of local chiefs, Bell played the role of honored guest, politely swallowing sheep's eyes, eating mutton roasted over fires

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fueled by camel dung and drinking the bitter coffee of the Bedouin.

Toward the end of March she came upon a spectacular ruin. "As soon as I saw it," she wrote, "I decided that this was the opportunity of a lifetime." Not a word had been published about it. Built in the sixth century, the huge stone-and-wood castle, known to the Arabs as Ukhaidir, was surrounded by round towers set in immense outer walls. Inside, courtyards gave way to elaborately painted, vaulted rooms. Despite the cold, Bell worked for hours at a time, photographing, sketching and drawing the plan of the castle to scale. Her men, nervous about Bedouin raiders, kept their rifles close to their sides. "The measuring tape is forever catching round the barrel or getting caught up in the stock, but I can't persuade them to lay the damnable things

Bell and Lawrence (here, in 1921) had both worked in Cairo during World War I.

down for an instant," she complained. Dressed in a petticoat, long skirt and dark stockings, she lay on the ground to take exacting measurements. She was convinced that this was a discovery that would secure her reputation as an archaeologist.

Leaving Ukhaidir, Bell traversed a drought-ridden desert littered with dead sheep and human corpses. At the ancient site of Babylon she visited the archaeological remains of Nebuchadnezzar's empire. "The most extraordinary place," she wrote; "I have seldom felt the ancient world come so close." In Baghdad she was welcomed by one of the city's most important Islamic figures—the Naqib. She felt "rather anxious," she confessed. The holy man almost never spoke to women, but after an hour of conversation, he invited her to his private quarters to meet his family.

At the end of her seven-month trip, she wrote: "We have reaped a harvest that has surpassed the wildest flights of my imagination. I feel as if I had seen a whole new world, and learnt several new chapters of history." But at the very last stop, in Constantinople, her spirits were dashed. As she dined

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"I feel as if I had seen a whole new world, and learnt several new chapters of history."

at the French Embassy, she learned that she had been scooped in her discovery of Ukhaidir. Before she had even had a chance to publish her find, a French archaeologist had written about the site. The fame and glory she had dreamed of had been snatched away. She was, however, the only one who had actually drawn the castle's plans (an invaluable aid to archaeologists and historians), and to this day her name is still linked to the discovery.

Undaunted, she returned to the desert 18 months later to pursue her scholarly work. Riding north from Ukhaidir, she planned to stop and visit with her friend David Hogarth, who was working on an excavation at Carchemish for the British Museum. The site was close to the place where the Germans were building a bridge for the Berlin-to-Baghdad Railway, and the British archaeologists were keeping a watchful eye while they dug at the Hittite ruins.

Word had been sent that Bell was coming, but to her great disappointment Hogarth had had to leave before she could get there. Nevertheless, his two young assistants were well prepared for her arrival. The senior aide, Campbell Thompson, was an expert in deciphering ancient codes. His junior was a 23-year-old graduate student by the name of Thomas Edward Lawrence. Short, blond and strongly built, Lawrence (who would later gain renown as Lawrence of Arabia) enjoyed dressing in a gray flannel blazer piped in pink, white flannel shorts and red Arab slippers. The tasseled belt around his waist marked him as a bachelor. Bell's arrival had set the local Arabs astir; since they knew Lawrence was eligible for marriage, they assumed that Bell was coming to be his bride.

Lawrence was less concerned with nuptial arrangements than with Bell's view of their work. Both he and Thompson were aware that she was outspoken and opinionated; a bad word in print by her could put their whole project to rest. But the young archaeologists were ready for the challenge. Showing off their knowledge of everything from Byzantine architecture to the price of camels, they were soon able to win her over. Departing the next morning, she left Lawrence to explain to the locals why "Gerty," as he called her, wasn't the woman he wanted to marry.

For the 45-year-old Bell, marriage

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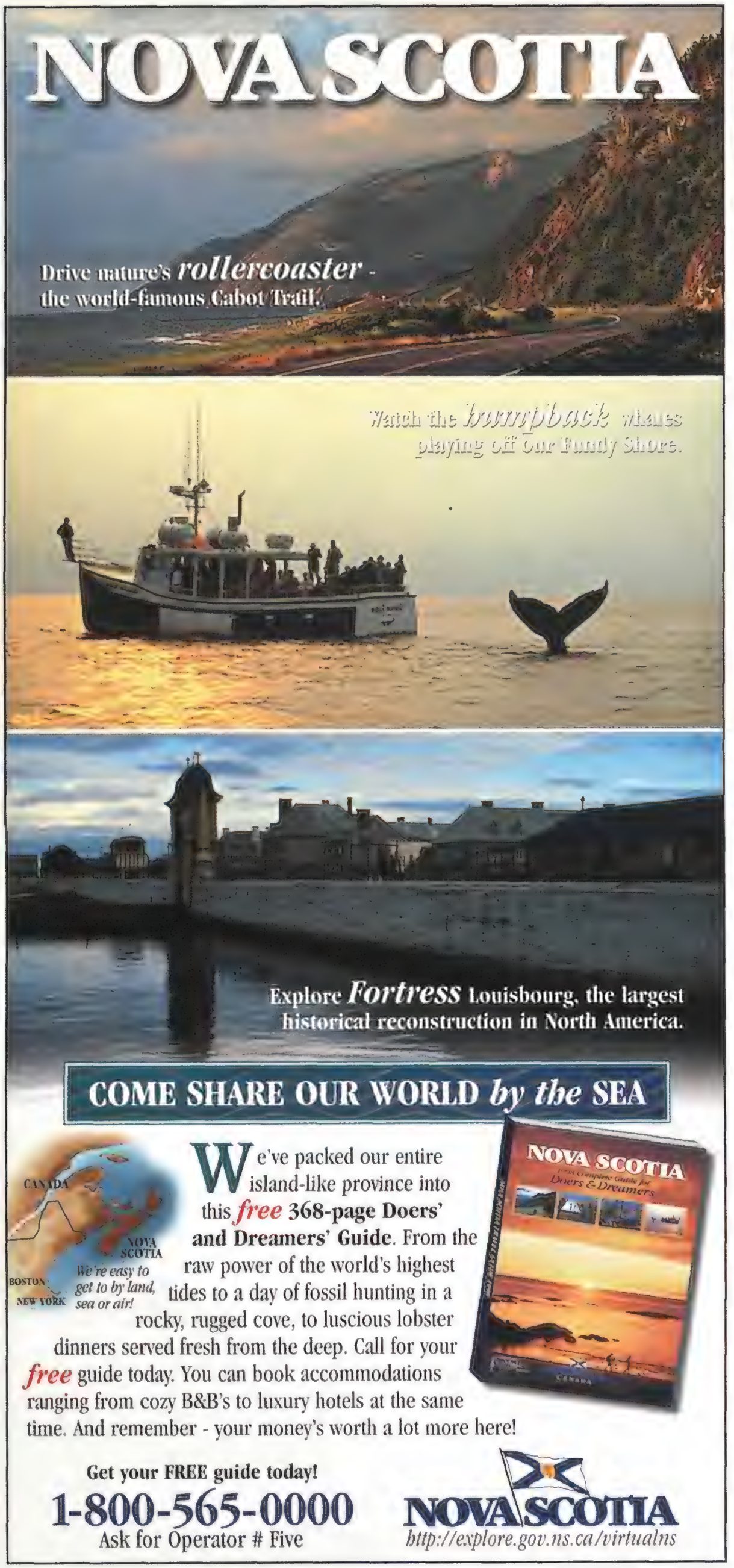
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seemed less and less of a possibility. Yet, at home in England in 1913 she fell madly in love. She had met Richard Doughty-Wylie on one of her trips through Turkey, where he had been the British vice-consul in Konya. A diplomat and army officer, he was an adventurer after her own heart. Her romance with him was intense but brief, dampened because he was married, cut short by his reassignment from London to the Balkans. Hearing that he was leaving prompted her to prepare for a trip she had yearned to make for years. It would become the journey of her life.

Against the warnings of the British and without the permission of the Turks, in December 1913 Bell set off from Damascus to penetrate the desert of northern Arabia. No Westerner had traveled the Nejd in more than 20 years, and the territory trembled with warfare as two tribes, the Rashids and the Sauds, waged battle. Bell had come prepared. "I need not have hidden the cartridges in my boots!" she wrote home. "We got through customs without having a single box opened." For several months her party crossed desolate sands, fighting brutal heat and bitter cold, warding off snakes, insects and Bedouin thieves.

Hearing as she traveled that a well-known bandit sheik was nearby, she thought the best tactic was to approach his camp and ask for protection. At first the ruffian welcomed her with coffee and fresh dates, but later he visited her camp and demanded that she turn over her belongings. Furious, she refused. The man left but soon returned. "Give me your pistol and your binoculars," he ordered. But again she refused, telling him instead that she would make a deal: he could have what he wanted if he'd give her an escort through his part of the desert. The sheik agreed, but the next day he took her men aside and promised to share the spoils if they would help him kill her. Her men remained loyal, but the scoundrel

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Bell was the only woman invited by Churchill (front row, center) to the 1921 Cairo Conference, held to determine the future of Mesopotamia. In her flowered hat, she looks as out of place as the two Somali lions. Lawrence is fourth from right in the second row.

grabbed her gun and binoculars just the same. As he bid her farewell, he tried to be friendly. "I say no word to you," she snapped. In her diary she wrote of the one-eyed rascal: "May God deprive him of the other eye."

Traveling on, she finally reached her goal, the walled city of Hayil, once a stop for pilgrims en route to Mecca and now headquarters of the powerful tribe of Ibn Rashid. An escort of slaves led her into the reception room of the royal guest house. There she met her host, the perfumed uncle of the 16-year-old ruling emir. She found him intelligent and friendly, but there was something in his eyes that made her uneasy. Immediately following their meeting, she was denied access to her camels and money, and the door of the guest house was slammed shut. She was a prisoner in Hayil.

For more than a week Bell was kept in her quarters, let out only to exercise in the garden and to visit the royal harem at night. In a scene straight out of *The Arabian Nights*, bejeweled, gorgeously dressed women served her coffee and sweets and filled her ears with tales of rape, revenge and internecine murder. "I had no idea what was in their dark minds concerning me," she wrote. "In Hayil, murder is like the spilling of milk."

On the ninth night Bell was called to the men's tent, where the chief eunuch presided. Too angry to be polite, she demanded her possessions and her freedom. She had to leave at once, she told them. Then, defiantly, she stood to go, knowing that no one but the most important sheiks stand while the others are still seated. It was a brazen act, but she was too upset to care. In fact, her boldness paid off: a few hours later she was given her camels and her money and was told that she was free to leave.

With her uncanny ability to meet the leading sheiks, Bell became a vital source of information.

By May 1914, Bell had returned to Damascus, having stopped along the way for the aforementioned visit with Fahad Bey of the Anazeh. The trip was long and exhausting, and she came back to England feeling defeated. "The end of an adventure always leaves one with a feeling of disillusion, just nothing," she wrote to Richard Doughty-Wylie. "Dust and ashes in one's hand, dead bones that look as if they would never rise and dance."

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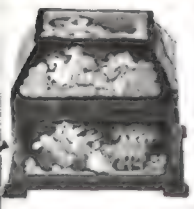
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The following month the archduke of Austria-Hungary was assassinated in Sarajevo and the world went to war. To Bell's regret, Doughty-Wylie was sent to Gallipoli to lead the troops. She was at a dinner party in London when she learned that he had been one of the first to be killed.

The British were determined to maintain their influence in the Middle East and undertook plans to help certain Arab factions revolt against the Turks. Officials who had condemned Bell's trip to Arabia now recognized how valuable it had been. With her keen eye for details, she had mapped uncharted sands, noting the location of water wells and railway lines. With her uncanny ability to meet the leading sheiks, she had learned which tribes were allies and which ones enemies. Furthermore, she could fathom who would be friends and who would be foes of the British. Suddenly, Bell had become a vital source of information. As a result, she was the only woman drafted as an intelligence agent in the Arab Bureau in Cairo, a bastion of fly-swatting, uniformed British males. The man in charge of the bureau, housed in the stylish Hotel Savoy, was her old friend David Hogarth.

In Cairo she encountered others she had known before, including her two young friends from Carchemish. She and the equally eccentric Lawrence quickly became soul mates. They dined together, shared gossip and enjoyed a mutual distaste for the French. During the day in the bureau she helped supply the information that would bring him fame as Lawrence of Arabia. Within a year he was off to the desert, acting as liaison between the British and Prince Faisal, a charismatic leader of a group of Arabs in their revolt against the Turks. As for Bell, she had been sent on an urgent mission to India to convince the viceroy, a friend of Valentine Chirol, to put up men and money to support the Arab revolt. Bell's connections

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Faisal, the first king of Iraq (right, foreground), and Bell picnic in 1921 near Ctesiphon, site of a seventh-century Arab victory. Bell became one of Faisal's closest advisers.

made her the only person in the bureau able to take on the task, and she completed it with aplomb.

Starting in 1916, Bell worked first in the strategic port of Basrah, and later in Baghdad. The only female political officer in the British Forces at the time, she reported directly to Sir Percy Cox, one of the diplomats who had warned her against traveling in the Nejd. She and the dignified Cox soon established a good rapport. But the rest of the men resented her presence and her opinions.

It did not help either that in the midst of war and misery, she had reached a personal crisis. "I don't feel like a real person," she wrote to Lawrence, "much more like some irresponsible flotsam carried here and there on the flood. . . . I hate war; oh, and I'm so weary of it—of war, of life." Under great stress, she was losing her temper and her hair. "Presently I shall have to ask you to send me a nice wig. I haven't got enough hair left to pin a hat to," she wrote her mother. She despaired over her worn-out boots and threadbare dresses, and one day in the dining hall, after yet another meal of tinned meat, she suddenly burst into tears.

"Not one, except Miss Bell, had any first-hand knowledge of Iraq or Nejd or, indeed, of Persia."

Bell regained her composure during the postwar years, but continued to invite controversy. When the officers' wives arrived, she did little to befriend them. She resented their preoccupation with Anglo ways and registered her annoyance over their lack of interest in anything Arabic. At parties for Arab and British officials, she sniffed at their low-cut dresses ("I do wish that our women would show some suitability in their attire") and was often blatantly rude.

Threatened by her friends in high places and her meddlesome ways, her colleagues avoided her in the office, tried to keep her out of the loop of cables and secret documents, shunned her in the dining mess and laughed at her behind her back. The teas that she gave on Sundays, meant to build friendships between British and Arab dignitaries, were mockingly called "PSAs" (Pleasant Sunday Afternoons), and her house was bitingly referred to as "chastity chase."

Her particular nemesis was Arnold (A. T.) Wilson, as brilliant, arrogant and literate as she, but a "sun-dried bureaucrat" who believed as stubbornly in direct British control of Mesopotamia as she did in some form of Arab self-determination. Nevertheless, when Bell was invited to discuss the "Arab Question" at the Paris Peace Conference in 1919, Wilson acknowledged that of the many experts around, "not one, except Miss Bell, had any first-hand knowledge of Iraq or Nejd or, indeed, of Persia."

But soon after she returned to Baghdad, Bell found herself in the midst of another rebellion, this time against the British. The Iraqi Arabs, who had been under Ottoman rule for centuries, now sought independence. In a policy paper, Bell wrote of the importance of Britain's support for increased Arab autonomy. To strengthen her position, she sent letters to friends in the government. When Wilson, then the Acting Civil Commissioner, discovered she was writing behind his back, he was furious. Their relationship turned worse when he resorted to using bombs and airplanes to put down Arab uprisings. He insisted that the Arabs had no right to sovereignty; she insisted they did. Bell's point of view prevailed when Wilson was forced out by the return of the Civil Commissioner, Sir Percy Cox, who favored her position on Arab autonomy.

The Arab rebellions were proving costly to the British. When Winston Churchill was made Colonial Secretary in 1921, he promised to end the economic drain. Summoning his greatest experts on the Middle East to a conference in Egypt, he sent invitations to 39 men and one woman—Gertrude Bell.

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hat and furs, Bell quickly went to work. When it came to a discussion of the Kurds, Churchill proposed autonomy. But Bell advised otherwise. An autonomous Kurdish state at that time could have led to further strife in Arabia and in Turkey, where the Kurds represented one-fifth of the population. Just as important, the Kurds' loyalty was never clearly defined. Some wanted independence; others preferred staying part of Turkey; still others wanted to be part of Iraq.

Bell, of course, was concerned primarily with Iraq, where the Kurds, though a separate ethnic group, were mainly Sunni Muslims. Combined with the Arab Sunnis, they constituted a majority of the citizens. Without the Kurds in Iraq, the Shiites, some of whom were calling for an Islamic state, would have formed a majority. Bell, who knew and trusted the Sunni Arabs, preferred a more secular, pro-Western Sunni government and thus urged that the Kurds be included in Iraq. Oil, then as now, was also a factor. Bell wanted Kurdistan as part of Iraq in order to keep Kirkuk, which was believed to be oil-rich, within its borders.

As for the question of who would lead this newborn nation, Bell and a former colleague were in agreement. The reclusive T. E. Lawrence, who had shepherded Prince Faisal through the Paris Peace Conference, had also been asked by Churchill to come to Cairo. Both Lawrence and Bell argued strongly in favor of Faisal; he had proved himself in the Arab revolt to be a consensus builder, and as a member of the Hashemite family, descendants of the prophet Muhammad, he had the respect of both Shiite and Sunni Muslims. In the end, Churchill was convinced.

After Faisal arrived in Baghdad, Bell was constantly at his side. For the next few months her task was to convince the Arabs to choose him as their leader. That was no mean feat. Faisal had no familial ties or historical roots in Iraq, and the Arabs had no

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desire to pick a puppet of the British as their ruler. But with her firm links to tribal leaders and local dignitaries, Bell was able to persuade them that Faisal was the best choice.

Bell was also instrumental in helping to determine the final borders of the fledgling nation. Some years before, she had pored over maps of Mesopotamia with her old acquaintance the Anazeh chief Fahad Bey, and with his input had sketched out her suggested delineations for the configuration of the new country.

In the summer of 1921, the Iraqis gave Faisal the throne. Early on an August morning, 1,500 dignitaries gathered on the lawn of a sumptuous Ottoman palace to witness the event. British and Arab officials paraded across a path of Persian carpets and climbed onto the dais in the center of the courtyard. While Bell watched from the front row, the band played "God Save the King" and the military gave a 21-gun salute. Faisal appeared dignified but solemn. As he looked out into the crowd, he caught her eye and she gave him a tiny salute.

As one of King Faisal's closest personal and political advisers, Bell became known in England and in Baghdad as the "uncrowned queen of Iraq." It was heady stuff and she wrote home: "I feel at times like the Creator about the middle of the week. He must have wondered what it was going to be like, as I do."

Though she had won high honors, including the praise of Britain's King George V, Bell remained controversial. After receiving commendation from Parliament for a white paper published in 1921, she wrote her parents: "The general line taken by the press seems to be that it's most remarkable that a dog should be able to stand up on its hind legs—i.e., a female write a white paper. I hope they'll drop that source of wonder and pay attention to the report itself."

As the Arab government of Iraq became stronger and more independent, Bell's relationship with Faisal changed from political counselor to social secretary. Restless and bored, she turned her attention back to her earlier passion—archaeology. With

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Faisal's approval, she wrote Iraq's first antiquities laws and founded the country's first archaeological museum—still among the finest in the world.

Sadly, Bell's later years were marked by loneliness and doubt. Despite all her achievements, at age 58 she felt that she had lost her importance—the Iraqis no longer needed her advice, her family had lost much of its great wealth, and the last of her loves had left her. What's more, she regretted not having married and never having had a family of her own. On a hot summer night in 1926 she took an extra dose of sleeping pills and never awoke. The next day, Arab crowds lined the streets to say farewell; the British gave her a full military funeral and buried her in Baghdad. "I don't care to be in London much," she had once written. "I like Baghdad, and I like Iraq. It's the real East, and it is stirring; things are happening here, and the romance of it all touches me and absorbs me."

Whether feasting on mutton in the desert or taking tea in Paris with Vita Sackville-West, Gertrude Bell was always aware of her surroundings and her own importance as a player on the political scene. "I feel like an Arab sheik," she wrote as she set out from Damascus with her caravan of 20 camels. Pockets of truffles were underfoot; wild boar rushed past. An hour outside Dumeir, the last outpost of civilization between Damascus and the Euphrates, she stopped to camp. That night she wrote home: "Already I have dropped back into the desert as if it were my own place; silence and solitude fall round you like an impenetrable veil; there is no reality but the long hours of riding, shivering in the morning and drowsy in the afternoon, the bustle of getting into camp . . . profounder sleep than civilization contrives, and then the road again."

Janet Wallach is the author of Desert Queen: The Extraordinary Life of Gertrude Bell, *published by Nan A. Talese, Doubleday, 1996.*

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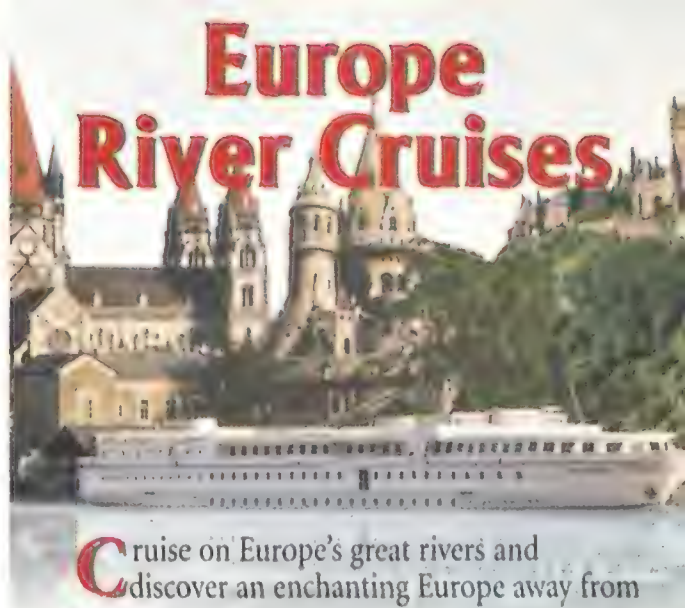

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The Seed Is Mine

CHARLES VAN ONSELEN Hill and Wang, $16

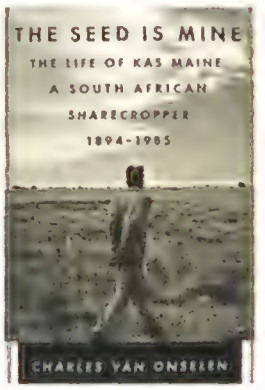
Across Boundaries

MAMPHELA RAMPHELE Feminist Press, $19.95

KAS MAINE WAS BORN IN 1894, LIVED as a traditional black patriarch and sharecropper on the South African highveld, and died at the age of 91 in a segregated rural slum, still clinging to the dream of planting one more crop, still struggling to maintain the dignity and independence that apartheid policies had stripped away. Mamphela Ramphele was born in 1947, the daughter of black schoolteachers in the Transvaal, and became one of the radical young activists who helped topple the apartheid system, surviving arrests and bannings to hold influential posts in the academic and corporate worlds of a new South Africa.

Two lives could scarcely be more different. Yet their biographies are like different threads in the same fabric, each part of the complex interweaving of forces bringing about South Africa's remarkable transformation. One can sense the stubborn dignity of the sharecropper as well as the selfless courage of the activist in the figure of Nelson Mandela. These biographies offer a rich understanding of people whose lives are the roots of history, the roots from which such symbols as Mandela spring up.

Historian Charles van Onselen's biography of Kas Maine, *The Seed is Mine*, is a truly great work of devotion, to a man's life and to the discipline of history. Van Onselen spent over a decade and a half doing the research for the book, including his interviews with Maine during the last six years of his life. Maine summoned almost total recall of all his landlords, the size of yearly plantings and harvests, the succession of droughts and good rains, his sales and purchases of livestock, his acquisitions of plows, planters, wagons and eventually tractors.



He documented with exactitude the marriages, births and deaths that shaped his growing family (his labor pool) from season to season, decade to decade. And he described precisely his off-season work as a diamond digger, water carrier, teamster, cobbler, leatherworker, blacksmith, horseshoer, tailor and traditional healer. He was able, also, to expound on the many challenges of his role as a patriarch trying to maintain his authority and protect his family in a paternalistic and increasingly racist society.

Although illiterate himself, Maine had kept a bag stuffed with any document, receipt, letter and scrap of paper that authorized or recorded his activities throughout his life. But it was his memory that amazed his biographer, as well as the "accuracy, depth and extent of his insights" into the economic, political and social structures that dominated his world.

Maine's relations with white landowners were as critical to the family's success as the vagaries of weather, blights of locusts or diseases of livestock. The Afrikaans and English settlers who gave land in return for labor and crops were part of a white-ruled society in which a black sharecropper had some power and choice. A landowner might turn out to be a trusted ally or a vindictive adversary. Maine sometimes received loans, and learned new skills, from his landlords. He stood ready to challenge their authority when any of them threatened his children (he had to defend one daughter after she poured a pot of tea over an abusive landlord). In the years before apartheid, it was even possible for Maine to appeal to the police or magistrates in a dispute with a landlord, and win. Yet this was a rare event in a society where individual decency ran against the grain of the settlers' culture.

In recalling the birth of his first son, Maine described the rule on the farms: "When a child was born you went to the landlord and said, 'We have had a baby boy.' The landlord would be pleased and say, 'Oh, you have had a little monkey, have you cut off its tail?' Then we would say, 'Yes master, I have cut off the tail, it's a person now, no longer a baboon.' That was how the white farmers used to put it to us." Paternalism was only

Mamphela Ramphele writes of a generation that rose to resist apartheid, as if from the ashes of a sharecropper's dreams.

a polite form of racism, which became virulent as rural paternalism gave way to the laws of capitalism and apartheid.

Van Onselen evokes the relentless, seasonal rhythms of Kas Maine's life like a Homer relating the wanderings of a black Odysseus. The book reveals a hero, but it does not spare us the ironies and cruelties of the patriarchal culture that defines this hero. Maine was a driven survivor who would plow his fields at night and work himself and his family beyond exhaustion. And even this did not guarantee survival. After one disastrous harvest and trek to a new farm, Maine recalled, "I was starving, my cattle were starving and my children were starving." When he managed to acquire half a bag of grain, "the horse and the children ate from the same half-bag." And he doesn't even mention his wives!

Even when Maine was most successful, inspiring envy in other tenants and landlords alike, his wives had to run the household economy without any of the profits from his sales of crops and livestock. The money all went into his pocket for more livestock, new plows or, later on, new tractors. The women had to steal cowpats from the fields at night and sell them as fuel, or weave straw baskets for sale, raise chickens and take in laundry to earn enough to buy clothes and run the household. And there were bitter, perennial fights over his wives' demand to send the children to school, while Maine insisted he needed them as labor, for himself or for his landlords.

Maine sometimes exercised the prerogatives of a patriarch over his family with the same indifference and cruelty that his white landlords and political masters showed in enforcing the prerogatives of paternalism and apartheid over him. He was ready to beat his sons and daughters into submission when they resisted or rebelled. And, even in old age, he denied a wife's pleas for a cinder block house to replace the corrugated iron shack they'd transported and lived in for more than 50 years—the money went to one more tractor.

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But his insistence on patriarchal authority was tied to the increasingly destructive rules and policies of a racist government that were driving his family off the land, denying their rights to own livestock or even farm for themselves, and turning a once independent black rural population into subservient laborers and slum-dwellers. In a shrinking world of choices, Maine was fierce in his determination not to give in. Yet that fierceness also alienated his own children, destroyed his labor resources as they fled the family, and further limited his possibilities as age and growing blindness sapped his own strength. When he insisted on buying that last tractor at the age of 86, van Onselen writes, "He was living in a resettlement slum surrounded by the neglected fields of a dying peasantry, whose labouring lifeblood had long since drained away to the cities."

In her autobiography, *Across Boundaries*, Mamphela Ramphele writes of a generation that rose to resist apartheid, as if from the ashes of a sharecropper's dreams. Theirs was a different kind of struggle, shaped by the realities of mass urban poverty, rural disintegration and the cultural destruction that apartheid had produced. Ramphele grew up in a hybrid family culture, both traditional and liberating. Her mother set the example of defying patriarchal rules, and she followed the example, choosing a career in medicine against her family's advice. "It was not the desire to serve which influenced my career choice," she writes, "but the passion for freedom to be my own mistress in a society in which being black and woman defined the boundaries within which one could legitimately operate."

Medical school also became the seedbed of political activism as she was drawn into the "black consciousness" movement and a deep friendship with the young leader Steve Biko, who urged blacks to have more faith in themselves and not let white

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liberals run their liberation struggle. Ramphele needed little urging, as her remarkable life demonstrates. In a world of police surveillance, orders that restricted her and other activists to remote places and forbade contact among them, and imprisonments that often resulted in brutal deaths (Steve Biko died of beatings in police custody while she was pregnant with their child), she combined medicine and activism. Ramphele's mission was founding and running community clinics for poor patients. Banished from directing her first clinic (a security agent told her, "Well, Dr. Ramphele, goodbye, you bitch!"), she soon started another in the province to which she was exiled.

It was the commitment and determination of men and women like her that ultimately broke the back of apartheid, and her autobiography is full of tributes to these activists, as well as to the priests and nuns, and white liberal allies, who sheltered and comforted her during her darkest moments of grief and despair.

In the twilight of apartheid, Ramphele took refuge in academia, turning from medicine to research, alarmed by the symptoms of social disintegration among poor black communities that a clinic could never cure. She became an anthropologist. Her work attracted the interest of Nelson Mandela, still in prison, who encouraged her, and who took to heart her criticisms of patriarchal abuses occurring within the liberation movement.

Banished from directing her clinic, she started another in the province to which she was exiled.

Ramphele is now working at the

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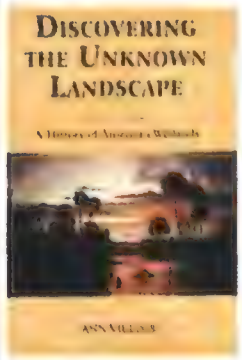
peak of South African society, as a vice-chancellor of Capetown University and on corporate boards of directors, to advocate the cultural changes that must accompany any real economic development among the poor. She writes: "Affirmative action as it has been pursued in the United States and in many other parts of the world assumes that 'outsiders' have to be brought into the mainstream to ensure their participation, without there being any fundamental questioning of that mainstream as a desirable social framework." Clearly, her success has not tamed this activist any more than the punishments of apartheid did.

Reviewer Paul Trachtman writes from his home in rural New Mexico.



Discovering the Unknown Landscape: A History of America's Wetlands

Ann Vileisis

Island Press, $27.50

STEAMBOATING THROUGH AN AMERIcan wetland in the mid-1800s, a traveler reported being "greatly annoyed, by the almost deafening, tumultuous and confused noises, of the innumerable flocks, of geese and ducks, which were continually flying to and fro, and at times blackening the very heavens. . . ."

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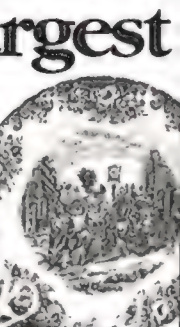

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tails why the devastation has occurred.

Blame Boston's founding Puritans, who equated swamps with sin, Sloughs of Despond where—as the Pilgrim William Bradford noted—Indian medicine men gathered "in a horrid and devilish manner." Or blame beaver-hat mania, which nearly wiped out the species and their dam-created swamps. Blame railroads. They made farming more lucrative, encouraging the draining of Midwestern quagmires into cornfields. Blame wrongheaded notions about flood control. Or fear of malaria. Or debris-spewing California gold mines.

Or blame a legal muddle. The law regarded land as private, water as public. But is a marsh soupy earth? Or earthy soup? Many enactments and congressional orations later, it comes down to a core American argument: What is the proper role of the federal government?

Ann Vileisis gives us the cultural history of America's wetlands in intricate detail, from Henry David Thoreau, neck-deep in a cranberry bog, gaining "a sense of the richness of life," to senators jockeying over the Swamp Land Act in 1849. But her book is so detailed it can be slow slogging for readers who are not environmental historians.

In the end, she offers hope that the "restoration" movement of the 1990s will re-create lost wetlands. Knowing history, and understanding our loss, she concludes, we may be ready to refute our mistakes "of a time when we knew no better." And possibly, she muses, "when Americans better know the story of their wetlands, they will understand why remaining swamps and marshes at the edges of their fields, their subdivisions, their shopping malls, and their industrial parks need protection. They may even walk into such places with curiosity and wonder. . . ."

Richard and Joyce Wolkomir are writers based in Vermont.

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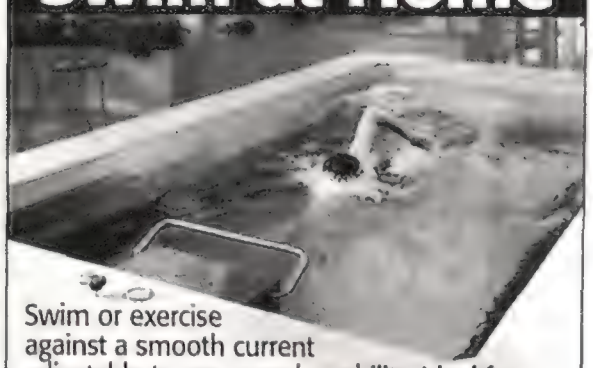
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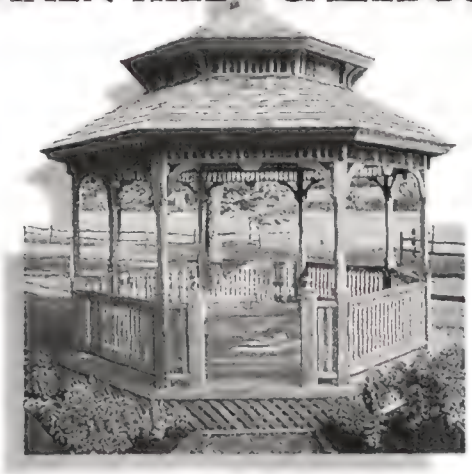

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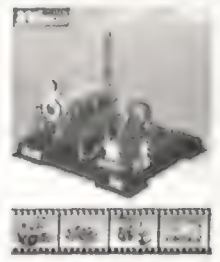

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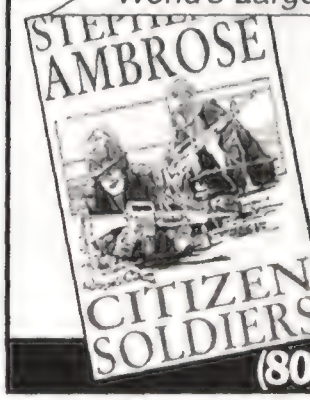

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NEW! **American Snapshots** Celebrate the historic towns and working communities that are the fabric of our national culture and heritage: **Puget Sound (Washington)** *September 24-27* and **Blackstone River Valley (Rhode Island)** *October 15-18*

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Hiking in Waterton-Glacier International Park (Montana and Alberta, Canada) *August 1-11*

Montana's Northern Plains Indians *August 5-12*

Oregon Nature and Wildlife *August 8-16*

Canadian Rockies Hiking *August 15-23*

Beneath Wyoming Skies *August 16-23*

New England Traditions and Treasures: Fine, Folk and Decorative Arts *August 24-30*

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Pacific Northwest: The Olympic Peninsula (Washington) *August 29-September 5*

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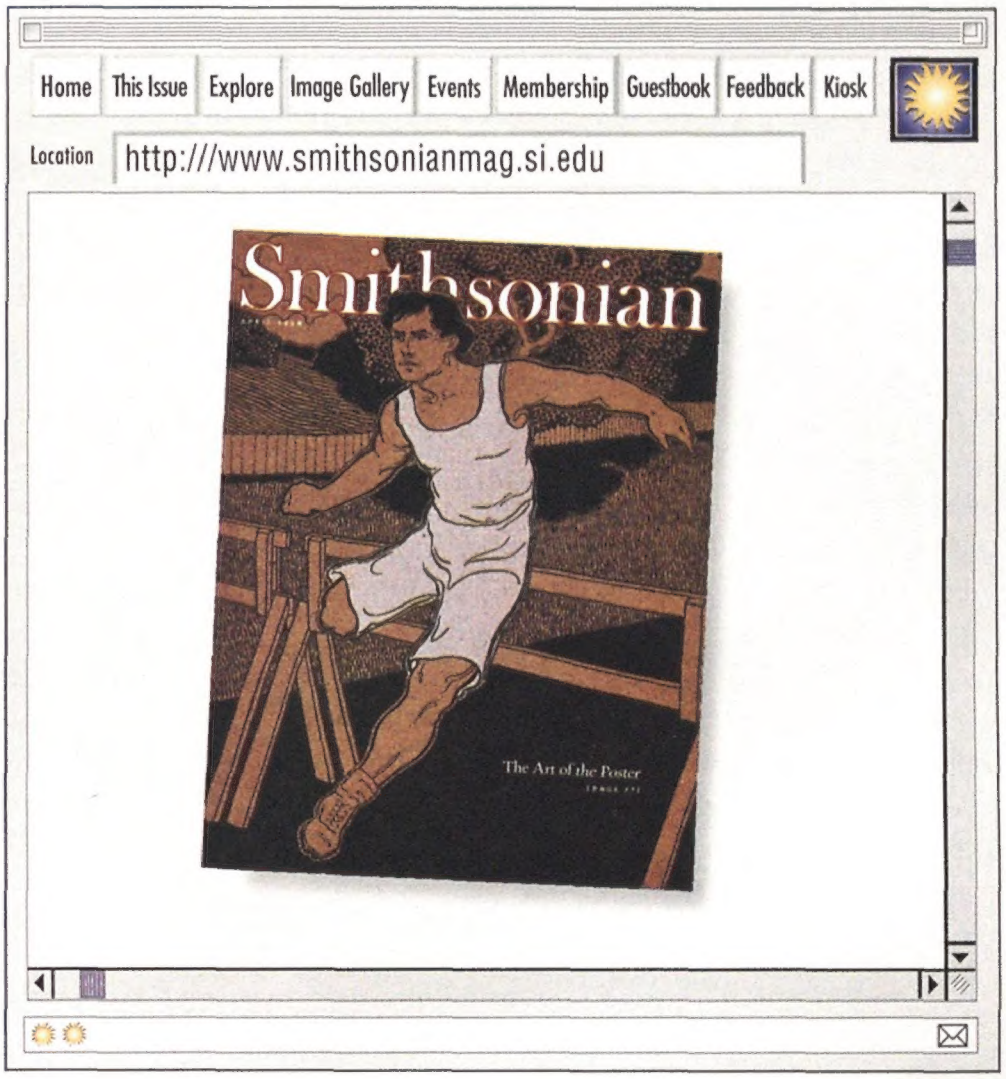

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THE LAST PAGE

When I Was Your Age...

BY BRUCE WATSON

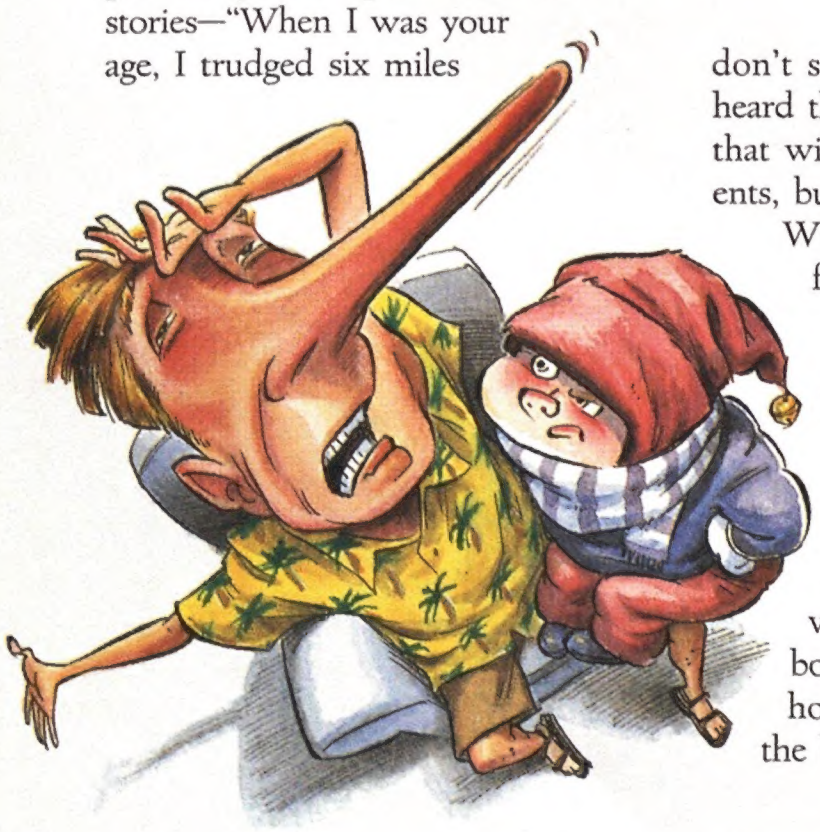
EVERY TIME IT SNOWS HERE IN New England and my children complain about putting on coats and boots, I summon stories from my miserable childhood.

"You call this snow?" I ask. "When I was a kid, we used to walk through snowdrifts eight feet high just to get to the woodshed."

"Dad," my 5-year-old daughter says, "you grew up in California. It doesn't snow there. Remember?"

She's right. It never snowed in my Southern California hometown. Darkest December saw the thermometer plummet to the mid-40s. I never trudged to school in driving sleet, never shoveled snow up to my waist, never grumbled through another grizzly March. And the only woodshed I saw was in books about New England.

A year ago, I made the mistake of telling my children this. They've never forgotten it. So while other parents get to spin those old stories—"When I was your age, I trudged six miles to school in a blizzard"—I have to make up my childhood hardships. I'm getting pretty good at it.



"You call this a sun?" I ask each summer. "Back in California when I was your age, the sun was so bright we had to wear welder's glasses. Take 'em off and you'd be blind in seconds."

"Wow!"

"And blue skies!" I rant on. "Skies so blue you could die of boredom. Same dull weather day in, day out, till you went mad. You don't know how lucky you are."

My wife says I shouldn't lie to the kids, but I disagree. Psychologists say parental exaggeration plays a vital role in a child's development. Or if they don't say this, they should. We've heard that this generation is the first that will not live as well as its parents, but we can't let them find out. We owe our children hope, a future, freedom from the drudgery of the past. To give them a sense of progress, we have to tell them how bleak our own childhoods were, even if they weren't.

My kids suspect I'm stretching the truth or just plain lying.

"Take my neighborhood," I say. "You kids get some privacy here. But during the baby boom, there were kids in every house. Kids swarming all over the block. Kids playing hide-and-seek, baseball, blindman's buff. I never had a moment's peace. Brutal! It was brutal!"

If my kids ever find out that my childhood was easier than theirs, my parental authority won't be worth the birth certificates it's printed on. How will I play the paterfamilias if they find out I got to eat all the cookies I could get my hands on? That I ate frostee cones all year round? That I got out of school in June and didn't crack a book, let alone put on shoes, till September? No artsy day camps all summer, no cramming into car seats, no daycare day after day. My childhood was just raw, naked fun, with the TV on all the time. As a cautionary growing up tale, this just won't do.

"I worked like a mule all summer long! Totin' barges, liftin' bales!"

"I thought you went to the beach all summer."

"Well, we did go to the beach. A few times. But it was hell. Or heck, at least. Heck's Beach, California. With blistering asphalt parking lots and oiled bodies soaking up the murderous sun. And me out there on the hot sand, sweating it out in my welder's glasses. You kids can't imagine how I suffered on that beach."

My kids suspect I'm stretching the truth. They may even know I'm just plain lying. But as a dad, it's my right and my privilege to have had a miserable childhood, even if I didn't.

"Dad, tell us again about how you had to trudge six miles to school in the blazing sun."

"Seventy-five degrees," I said. "Sometimes 80. You kids don't know how easy you have it."

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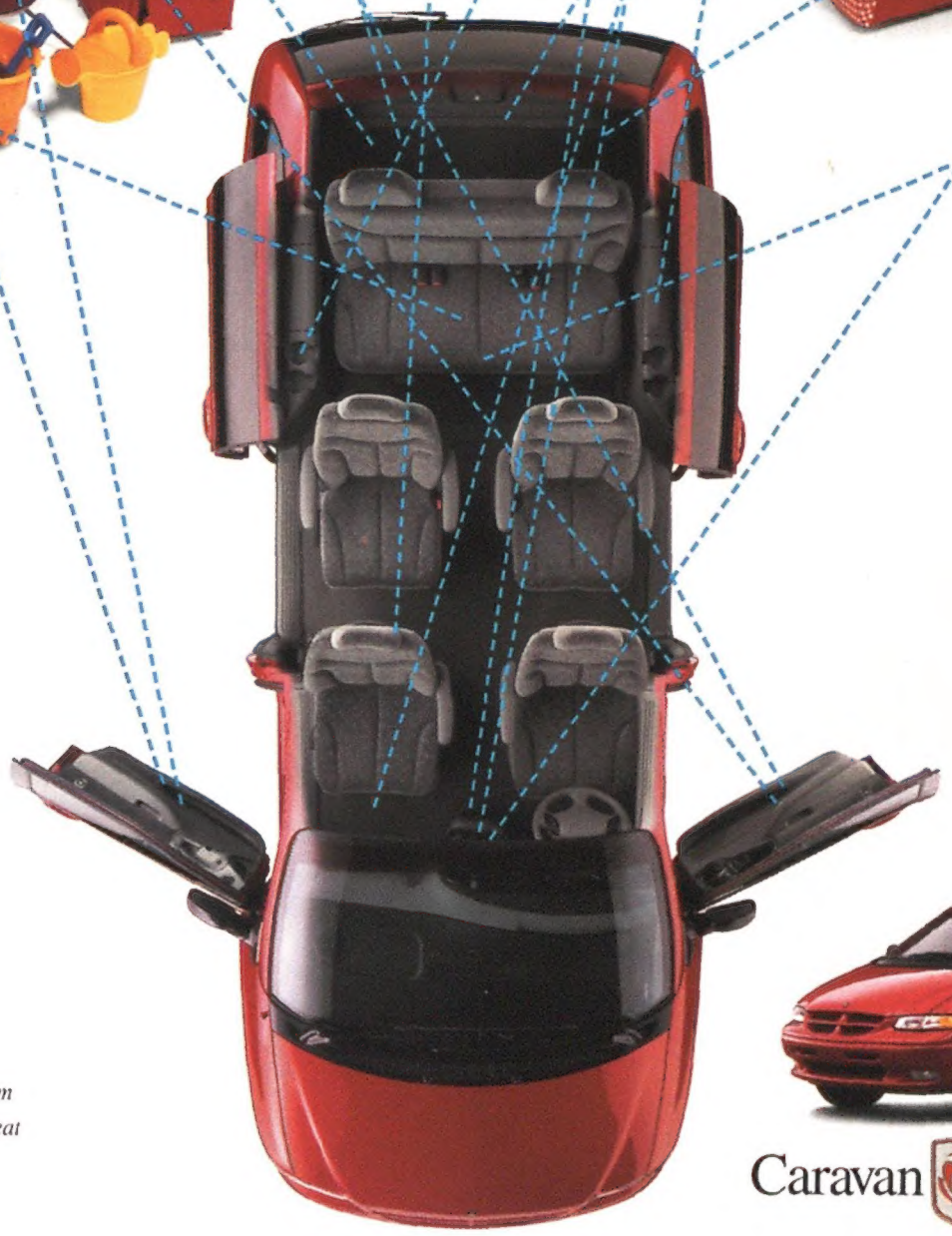

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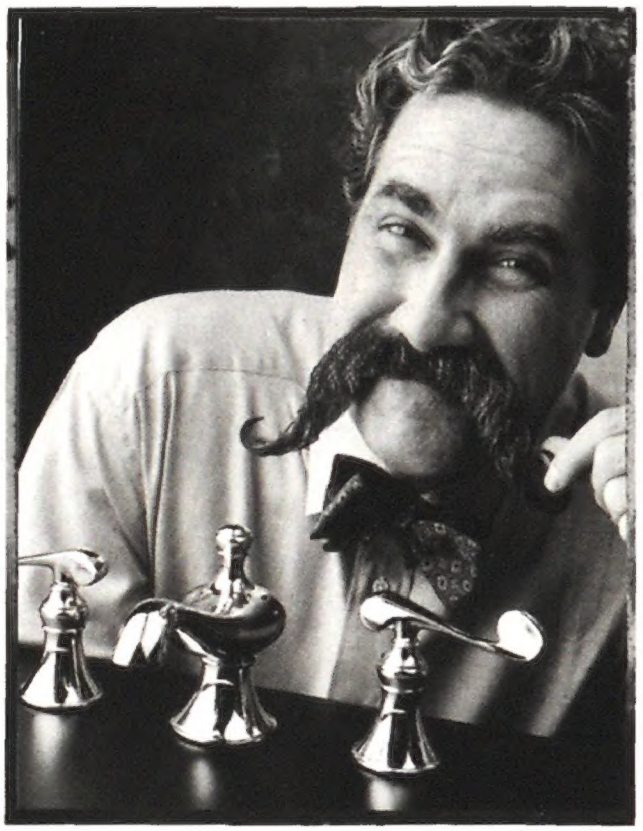

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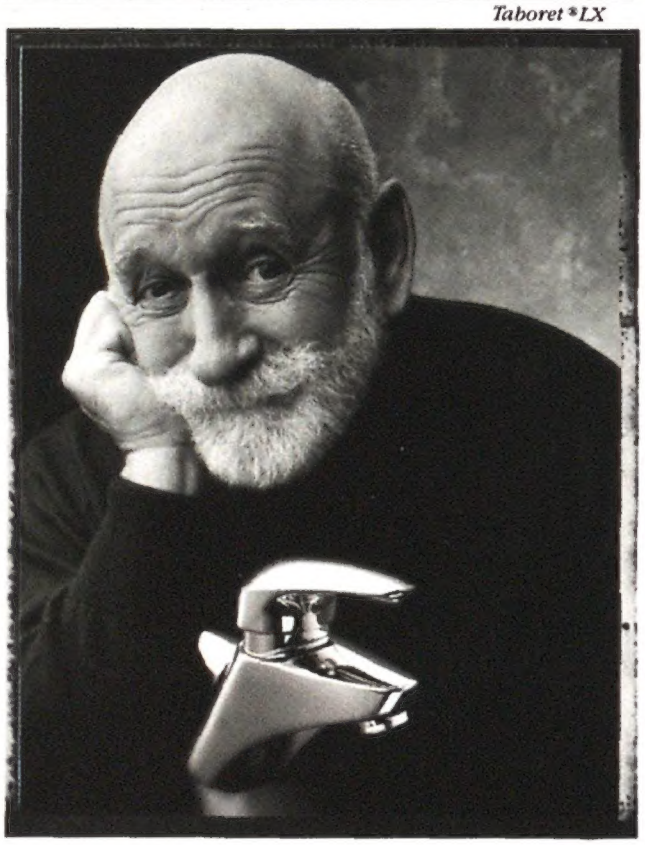

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